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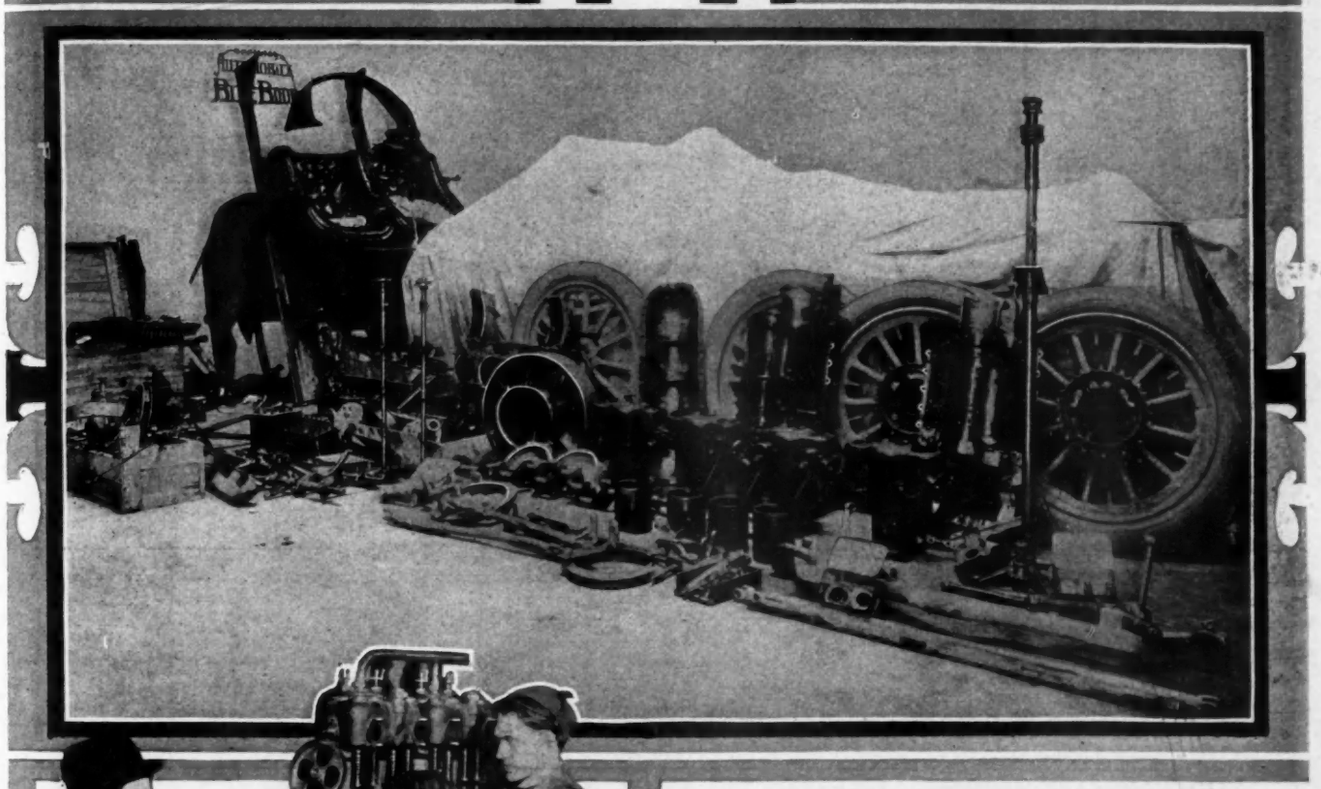
THE AUTOMOBILE



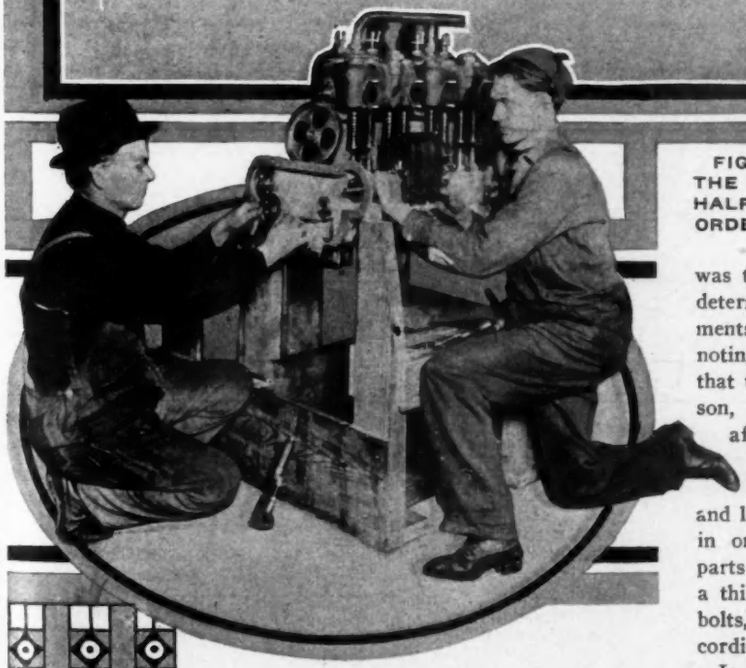


FIG. 1—ORDERLY GROUPING OF THE COMPONENTS OF THE DISSEMBLED AUTOMOBILE. FIG. 2—MARKING THE HALFTIME GEARS AS THEY ARE TAKEN DOWN IN ORDER TO FACILITATE CORRECT REPLACEMENT.

SYSTEMATIC methods produce the best results in a repair undertaking, as well as they do in the manufacture of automobiles. The title illustration of this article shows a 1906 model of a well known make of automobile, after fairly continuous service up to this time, with the exception of a somewhat extended overhauling to which it was subjected last year. In the present undertaking, it was the idea to inspect each part very carefully in order to determine, not only the extent to which repairs and replacements would have to be made, but with a view to carefully noting deformation, or evidences of fracture, and to be sure that the parts should either be abandoned for a definite reason, on suspicion, or be used in the reassembling process after passing a rigid inspection.

It was considered of the first importance to dissemble the car systematically, clean every part thoroughly, and lay them down in proper groups (a) all the motor parts in one group; (b) the transmission gearset and relating parts in another; (c) the members of the control system in a third; (d) the multiplicity of relating members, including bolts, nuts, keys, etc., laid out in systematic groupings, according to their several uses.

In the process of dissembling the car, all the parts were properly marked or so tagged that they were readily identified in the subsequent assembling process, and the halftime gears were spotted and identified so that they were readily put back into place, as shown in the lower figure of the title illustration, thus eliminating unnecessary labor, and the chances of future trouble. It is believed that this careful process of taking the car apart, cleaning all the pieces, and laying them down in a light and accessible place, is likely to have a wider influence on the quality of the work, and the

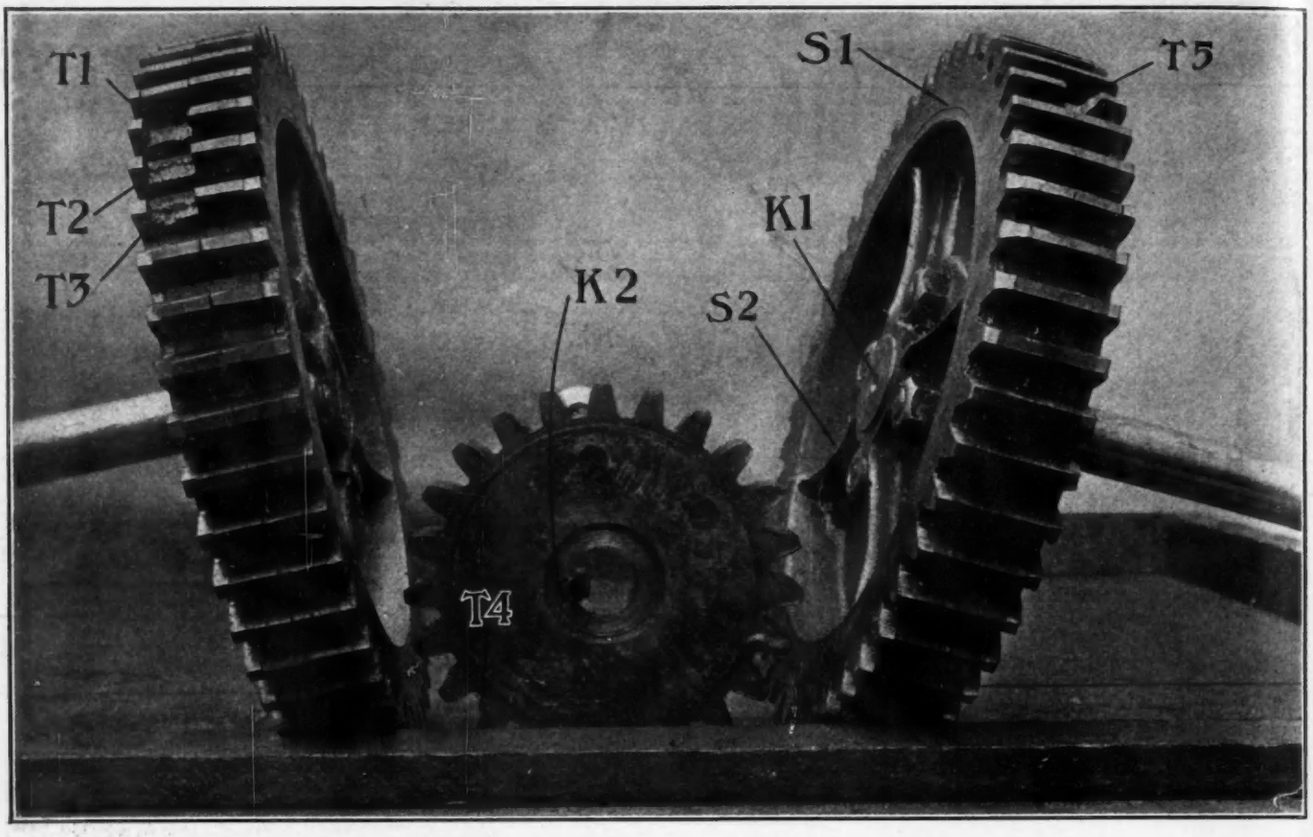


Fig. 3—Halftime gears of shrouded fiber, and pinion of steel, showing condition of the fiber, and the wearing away of the teeth of the pinion

cost thereof, than anyone would readily realize. It costs a considerable amount of money to have skilled workmen searching for lost parts every time they make a move, and obviously in the absence of a system of this sort, all the parts are lost all the time, because if they are not in a definite known place, they have to be searched for when they are wanted.

The average repair man, if he makes a jumble of the parts, is enough of a machinist to reproduce them readily, and it is much more of a pleasant task for him to reproduce a part than it is to make a diligent search in a disorderly arranged pile of parts. Everything in connection with repair work indicates that an orderly array of the members after they are properly cleaned and inspected, is one of the best investments that can be made, and the first principle of good repairing lies buried in this one idea.

SOUND JUDGMENT IS OFFERED A WIDE OPPORTUNITY

Many autoists have complained bitterly of the extent to which they were lead into repair work, which extended beyond their reasonable expectations, and which proved to be unprofitable in every way. When a used car is taken apart and strewed about haphazard, it has a most discouraging look, and the repair man of small skill is likely to reach the conclusion that the parts are substantially worn out, and that new ones will be necessary in order to produce the desired result.

Under such conditions, if the bent of the repair man is to guide the owner of a car, he will have for his pains a new automobile, but he will have purchased it drib drab fashion at an enormous cost. A new car, direct from the maker, will have many advantages under such conditions. Obviously, a good repair man will be an optimist under such conditions, and instead of running off to the maker of the car for enough new parts to satisfy the situation, he will interject a fair measure of ingenuity and avoid in every possible way, the purchase of new parts.

If replacements must be made, it is far cheaper to order them directly from the maker of the car, than it is to reproduce them in a repair shop. The workman is paid by the hour; he will not be able to reproduce the parts until the material is procured, and whether or not he goes after the material, or sits around waiting for it is to be brought to him, is a matter which results in cost, the amount of which will most likely exceed the price of the replacements from the maker of the car.

That a repairman will be able to produce parts which will be better than those to be had from the maker, is scarcely to be believed. The repairman works under the greatest possible disadvantages; he is not in a position to select intelligently the materials, and he is without the working drawings from which the arts were originally made, so that "rule of thumb" and methods involving surmise will represent the boundaries of such efforts.

SOME PERPLEXING PROBLEMS CONFRONTED THE REPAIRMAN

In this particular undertaking, there were some perplexing problems to be solved, among which the overhauling and timing of the valves will be mentioned. The valves were in excellent order, but owing to repeated grinding, the seats were very wide, and it was believed that it would be difficult to maintain them tight against leakage. It was decided therefore, to bore out the passageways sufficiently to reduce the face of the valve seat, with a view to inducing a better condition.

The valve stems battered the ends of the tappet rods so much that timing was quite impossible of realization, and the cams were worn so that in the absence of any adjustment, provided by the maker, it was decided to do one of three things as follows:

(a) Purchase new camshafts, lifts and valves.

(b) Improvise a means of adjustment on the lifts.

(c) Purchase new valves with stems long enough to make up for the difference.

In a further examination of the system, and considering the work which would have to be put upon the valve seats to render them fit, it was decided that the adjustment difference could be made up by grinding the valves on their seats, so that the stems would extend down towards the lifts, a part of the total

distance to be made up, and it was further decided that the valve seats could be machined down for the rest. In this way the repair undertaking was completed satisfactorily and without the purchase of any new material at all, and it is believed that the timing will be quite in keeping with the best expectation, considering the ability of the car in the first place.

HALFTIME GEARS RENDERED EXCELLENT SERVICE

Referring to Fig. 2 it will be observed that the halftime gears were of the shrouded fiber type, meshing with a steel pinion. The fiber lasted for a considerable time, but in the long run it rotted out and the teeth broke off as shown at T1, T2 and T3 in one case, and T5 on the other gear. The shrouds S1 were of phosphor bronze, and were riveted into secure relation after the pressure was put on in the process of manufacture. The fiber gears were built up onto a spider S2, and were keyed onto the shaft by means of regular key stock as shown in key K1.

The pinion was keyed on its shaft, and the key K2 was rather loosely fitted, with a considerable radial appearance, which may be noted in the illustration. The teeth of the pinion T4 were badly ground, and were therefore much deformed, which grinding process is due to rubbing contact with the fiber of the halftime gears. It is a well understood fact that fiber has this grindstone property, and in the machining process, because of it, the tools are dulled very quickly.

Fiber is used in halftime gears because it is not a noise producer, although the grinding process, as above mentioned, is likely to produce a perceptible hum or grating noise. If it is desired to get away from whatever ills there are attached to the use of fiber, it will be necessary to "lead" steel gears, in order to cause them to perform without noise. In the leading process the flange under the teeth is cut back to form a recess, and Babbitt metal is poured in all around the inner periphery, after which it is machined down to a uniform thickness. This process eliminates noise, under the conditions named, and the ability of steel gears may then be taken advantage of. The steel, if it is rendered extremely hard by heat treatment, will be more likely to produce noise than if it is left in the normal state. Following out the same line of reasoning, cast gray iron halftime gears, properly cut, will make less noise than steel gears. Bronze, on the other hand, has excellent "bell" properties which are extremely difficult to deaden.

In dissembling the motor, it is necessary to "spot" the meshing gear teeth, in order that the same teeth will be reengaged during assembling; otherwise the timing of the valves will be thrown out, and the motor will have to be retimed, which, to a novice, may not be an easy problem to solve. Even with skilled men it is better to spot the gears, so that they may be quickly replaced, thus saving the necessity of going over the timing, and this foresight will react in favor of a lower cost of the undertaking.

CHASSIS SIDE BARS PROVED TOO LIGHT FOR SERVICE

The best indication of the lack of suitable strength of the chassis frame is presented in Fig. 4. The frame broke at a point about 5 inches back of the rear arm forming the motor support, and in line with the center of the flywheel, thus showing that the work transmitted to the side member at a point opposite the flywheel was greatly in excess of the ability of the side member to sustain. Cross-bracing was depended upon entirely through the motor frame, and the nearest lateral back of the motor arm was found to be far enough away to be of no value in restraining the twisting movements induced by the motor in service.

The motor vibrates considerably at the higher speeds, and a close examination of the same would lead to the conclusion that the clutch, which is a weighted contracting band type, is not in good kinetic balance. No doubt the clutch was statically well balanced, but the considerable vibration set up in the motor at

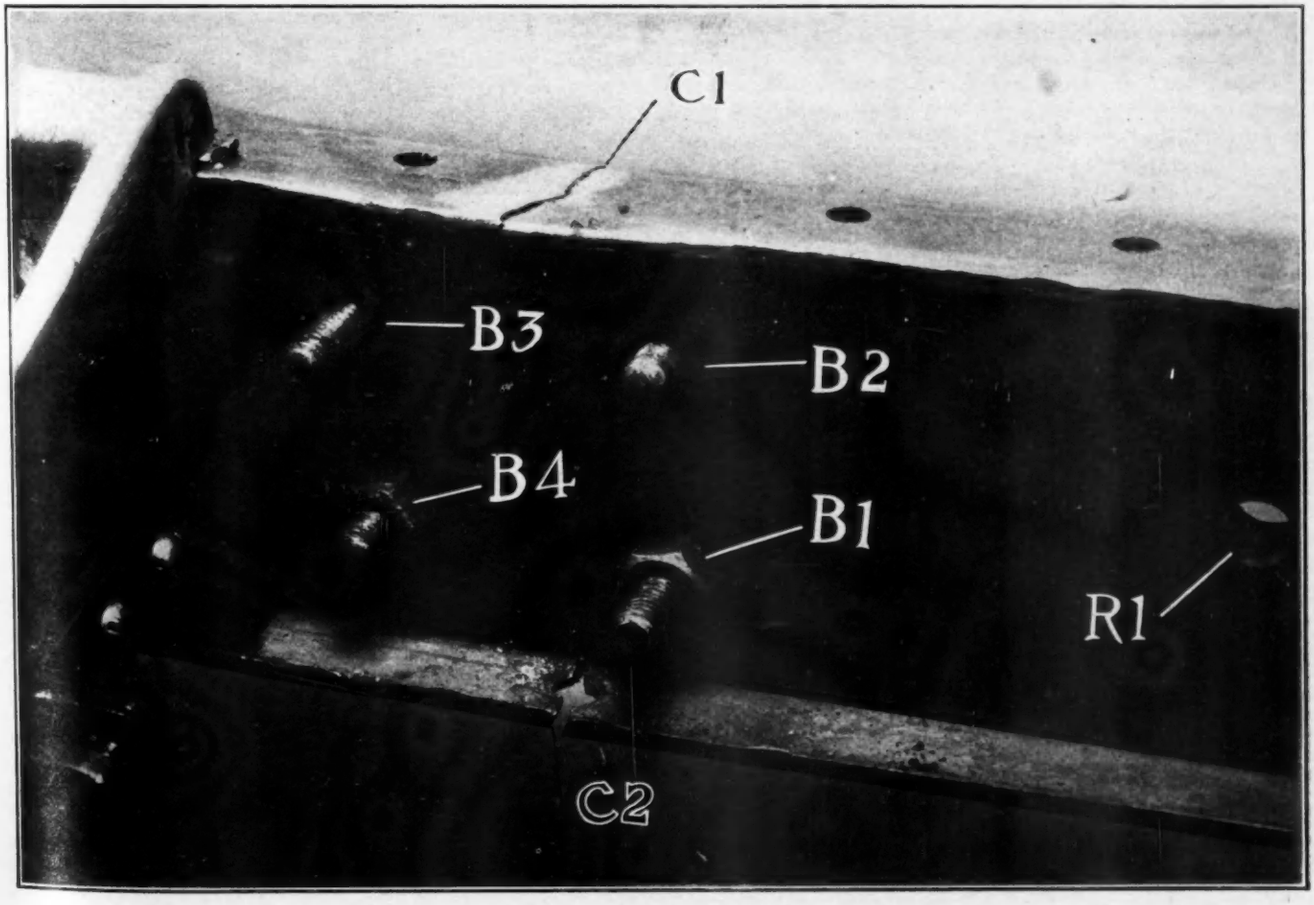


Fig. 4—Broken side bar showing evidence of lack of strength and the repair plate bolted and ready to rivet into place

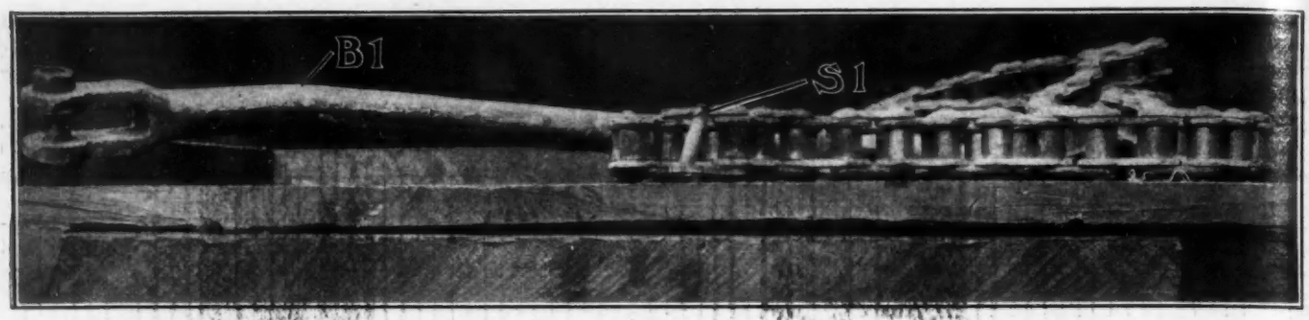


Fig. 5—Presenting the bent radius rod showing lack of due strength, and the sprocket chain with evidences of much wear

the higher speeds cannot be accounted for in any other way than that due to the absence of kinetic balance which is an impossible condition in practice, if a counterweight is employed, provided the same lacks in symmetry, comparing it with the mass which has to be counterpoised. Referring again to the figure, the fracture C1, is irregular, and in the plane slightly out of the vertical, which will be noted by observing the location of the fracture C2 at the bottom flange. The trouble started at a bolt hole in the bottom flange, and a further examination of the metal indicates a crystalline condition, which might have been due to vibration, although it is possible that the metal employed was of a basic character, rather high in the metalloids.

In the repair of this chassis frame a plate, substantially a quarter of an inch thick, without flanging, was laid up against the webb on the inside and riveted to the side bar. One of the rivet holes, R1, is shown in the neutral metal, and this is obviously a valueless situation. The rivets should be placed at points near the top and bottom flanging, in order that they might support the repair plate in its relation to the damaged side bar, in the zones of extreme fiber strain. The bolts B1, B2, B3 and B4 are placed on the two sides of the fracture, and bolts are employed in this location in order that they may be utilized in attaching other members of the car makeup to the frame. Riveting is better, and hot riveting is better than cold, because as the rivets cool off they will draw the plate tightly against the broken side frame, thus making them more efficient.

DISTANCE ROD NOT PROPERLY PROPORTIONED

These members, considering them structurally, belong to the two pin strut family, and, unfortunately, the work comes on diagonally, and the amount of the loading varies over the broadest ranges. Fig. 5 shows that this rod was round in section,

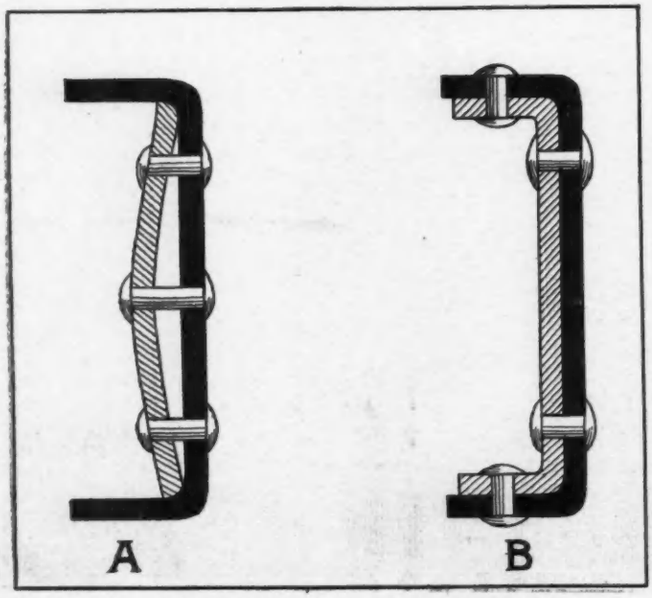


Fig. 6—Two methods of reinforcing side frames: A depicts the one selected; B portrays the more substantial way

and that it deformed at B1. Since the rod was of uniform section it is reasonable to suppose that the point at which deformation took place is that of greatest concentration of the load, and one way to maintain the minimum of weight would be to make the section greatest at the point of greatest strain, and taper off in both directions therefrom. The formula used for proportioning struts and columns, while it is of excellent value, is nevertheless involved in uncertainty, and a practical example such as this offers many advantages to the car builder, and shows the repair man what to do if he wishes to make a permanent repair.

The same illustration presents one of the sprocket chains, and the rivet S1, which is attached to the repair link, is loose in the link hole, which is an undesirable condition, but it is the method by which it is possible to prove that riveting should be very properly done throughout chains, in order that the life thereof will be long and satisfactory. A further examination of the chain will tell that the rollers were considerably worn, and this is an indication of the fact that the sprocket teeth are much deformed, due to wear, so that a severe wedging action takes place every time each link settles into the sprocket teeth.

In making a repair it is a common practice to absolutely disregard the condition of the sprockets, and to attempt to apply new chains to them. The result is bound to be costly and unsatisfactory, because the new chains will be destroyed, due to the wedging action of the worn teeth of the sprockets, and it will be the heighth of economy to place new sprockets on the car with the new chains, thus bringing this important portion of the automobile up to its original high standard, and in this way reduce the greatest noise producer to a condition of substantial silence.

PISTONS AND RINGS SHOW CONSIDERABLE DEPRECIATION

The four pistons as they were taken from the motor were grouped as shown in Fig. 7 and enlarged in order to bring out the information desired in relation to depreciation. Each piston has five rings with overlapping joints with parallel faces, and the greatest trouble seems to be due to fracture of the metal of the rings at the joints. R1 shows a joint with one of the overlapping projections broken off, and a very small portion of the face still in contact with the uninjured extension of the joint. R2 presents an accentuated case with the same character of fracture. R3 is different in that the ring broke off at a point in the full section back of the joint. R4 shows a ring with both ends broken back of the joint, and the other rings on the same piston are in practically the same shape. There are two serious phases to this character of trouble; the broken joints suggest that the disjointed portions of the metal will remain in the groove, for a time at any rate, and it will be a most fortunate circumstance if they do not score the surfaces of the bore of the cylinder and do other damage besides.

The rings, in addition to showing that they were rendered "rotten" in service, lost their temper and slunk away into the grooves, so that they were incapable of rendering the service for which they were originally placed. The compression must have been very poor in these cylinders for a considerable time before the motor was dissembled, and this is an excellent illustration of the futility of running a motor after the compression falls down, and not only on account of the poor service it will render, but in view of the damage which will be done by the disjointed

portions of broken rings. The right procedure is to ascertain why the compression falls below a reasonable standard, and it is always necessary to dissemble the motor sufficiently to permit the inspection to be made with certainty. The pistons should be removed from the cylinders, the rings should be carefully inspected, foreign substances scraped off, and the rings should be examined to see if they float freely in the grooves. They should also be observed with a view to showing that they are of the right diameter to serve as packing rings, and if they prove to be too limber and do not press firmly against the cylinder walls with a certain uniformity all around the diameter, nothing remains but to resort to one of two choices as follows:

(A) Purchase a new set of rings of the right dimensions and insert them in the grooves to replace the inefficient rings.

(B) Remove the rings from the grooves in the pistons, and pein them out to a new uniform diameter, which should be slightly greater than the bores of the respective cylinders.

(*Continued on page 694.*)

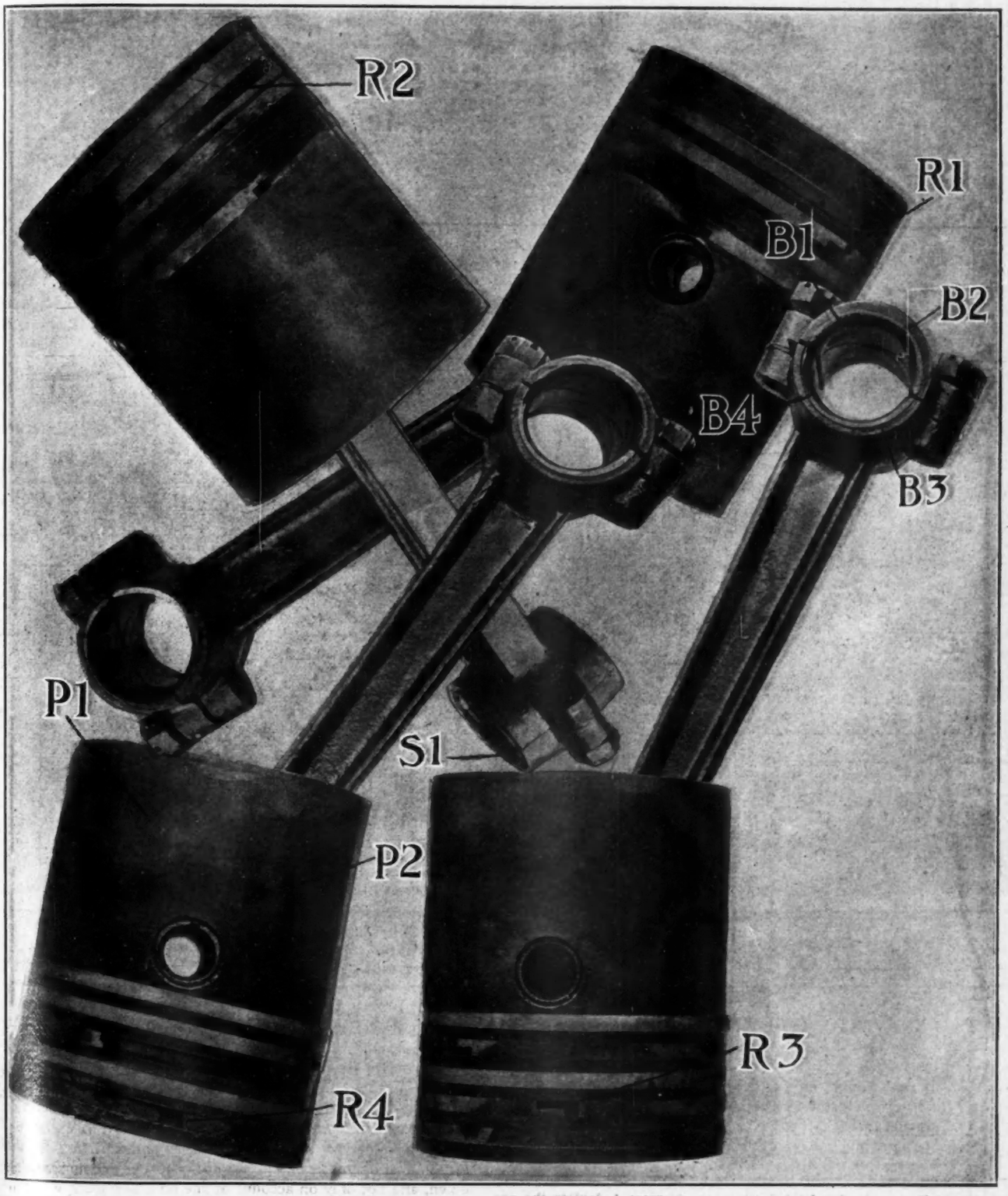


Fig. 7—The four pistons and connecting rods as removed from the motor showing broken packing rings and uneven wearing

Laying the Foundation of the

By THOS. J. FAY

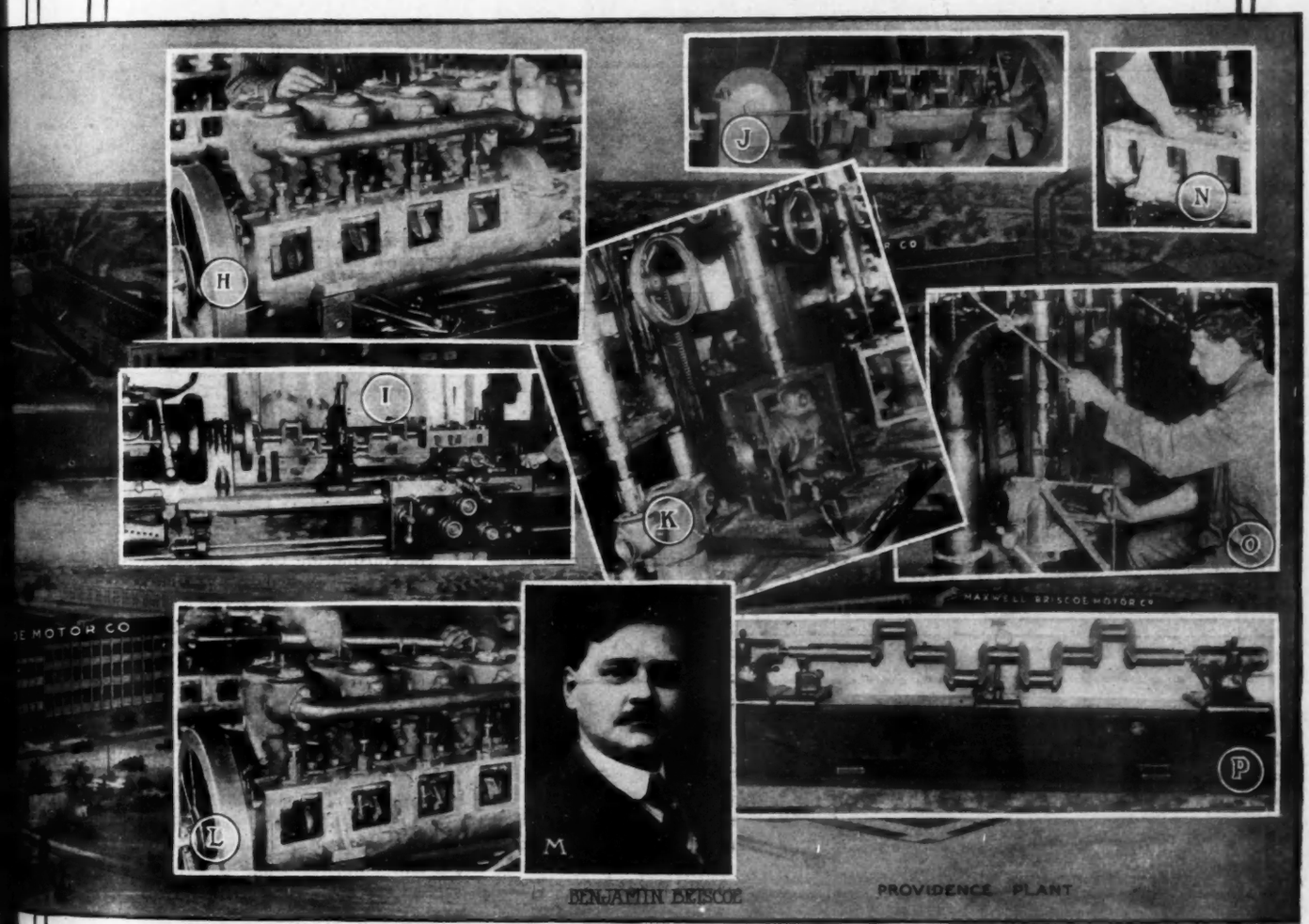
INDUSTRIAL success, if the modern tendency portrays the right idea, is based upon the concentration of effort. In defining concentration care must be exercised in order to discriminate between the character of the undertakings which will result in a healthy expansion and the shrinking process which is bound to result when attempts at combining individual plant efforts result in a diminished output. The master mind must control the movements of the helm, steer clear of snags in the course ahead, and judge properly the license which it is safe to take in every emergency.

There are divers reasons why a series of manufacturing plants, located at different industrial centers, but under one management, will go a long way toward solving intricate problems. In individual, independent plants it is extremely difficult to induce a condition of "give and take." The lack of flexibility is prone to inequalities of the effort, resulting

in a rush condition during a part of the year and idleness for a time. The skilled labor is barely brought to a condition of "good teaming" when the work runs out, and the effort at harmony of organization is dissipated when the workmen depart from the plant and search for new fields to conquer.

In the association of a series of plants, if each one is devoted to the manufacture of a separate character of the automobile, the respective plants will be free to produce the wares for which they are best designed, but they will be in a position to co-operate, because their respective idle periods will not synchronize with each other; when one plant is suffering from lack of regular work, the other will be in a state of congestion. There being a certain similarity of the machinery equipment used in the several plants, there is nothing to prevent the interchange of work.

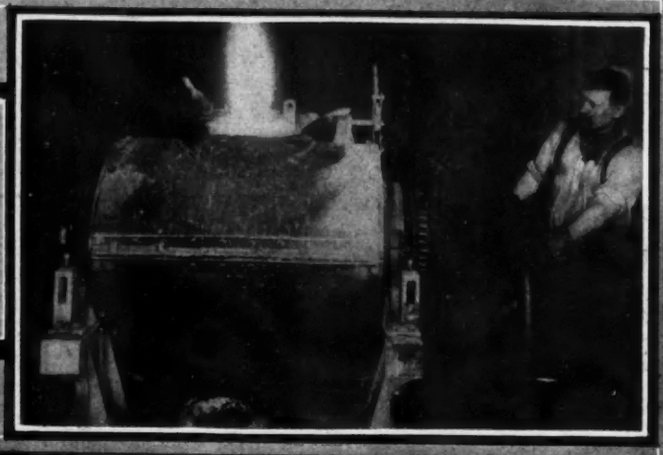
Some time prior to June 21, 1904, J. D. Maxwell, of the Maxwell-Briscoe Motor Company, completed the first design of what is now well known as the Maxwell car, and Benjamin Briscoe undertook the organization of the Maxwell-Briscoe Motor Company, the preliminaries of which were completed on the above date. What is now known as plant No. 1, at Tarrytown, was acquired on October 1 of the same year, and 250 workmen were organized into a compact force and directed in the production of Maxwell cars.



United States Motor Company

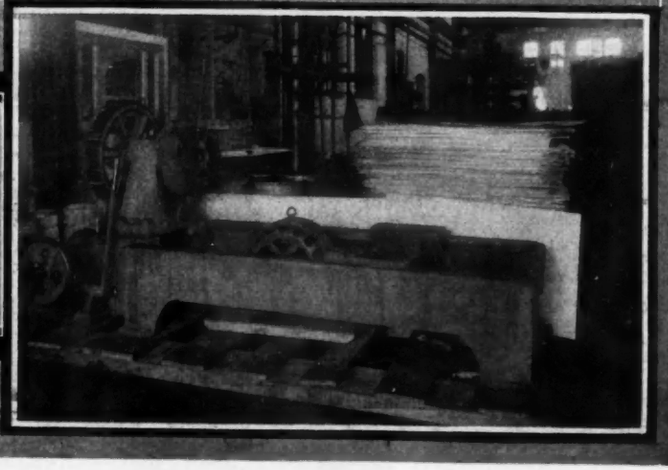
A—Monster Toledo press which is used to form sidebars
B—Crankshaft grinding machinery from the battery of grinders, by means of which accuracy is induced
C—Final test of motors, by means of a calibrated fan
D—Grinder used for accurately finishing the crankpins of Maxwell crankshafts, of which there is a complete battery
E—Making the run-in test of a partly assembled motor in conformity with the Maxwell progressive system
F—J. D. Maxwell, designer of the Maxwell, vice-president of the Maxwell-Briscoe Company, in general charge of factory
G—A unit in the multiple spindle drill equipment, of which there are numerous types in use in the various plants
H—Run-in test of motor after cylinders are in place
I—In the process of finishing crankshafts on a lathe
J—Crankshaft run-in test made before the crankshafts are mounted in the motors, in order to determine accuracy
K—Cylinder in a fixture on the platen of a radial drill
L—Assembled motor ready to go to the fan-dynamometer
M—Benjamin Briscoe, now president of the United States Motor Company. Originator of the progressive method of manufacturing automobiles, taking advantage of the possibilities of reciprocity between a series of dissimilar plants, to make the output continuous throughout the whole year
N—Cat-head in drill press facing off aluminum crankcases
O—Example of the utility of special fixtures
P—Instrument of precision. In this example the crankshafts are measured for accuracy; pins must be round and true to pass—an error of 0.0015 inch will be noted on the extensometer

Many Enormous Presses Turn Out Great Quantities of Pressed Steel



Rotary Furnace About to Discharge Molten Metal

One Day's Foundry Output of Aluminum Crankcases.



New Rotary Field Testing Machine for Torsion Tests.

Ten cars were produced during the first year, and the progress made from that day to this will best be appreciated by observing the growing output, as follows:

MAXWELL-BRISCOE PRODUCTION FROM 1904 TO DATE

Year	Automobiles Shipped
1904	10
1905	823
1907	3,785
1908	4,455
1909	9,460
1910 to March 31	4,677
1910 for balance of year (estimated)	18,000

Note.—The estimate of the balance of the cars which it is expected will be produced before the end of this year is reflected in the present rate of production, which figures out 2,300 automobiles per month.

Prior to the merger which was at the bottom of the organization of the United States Motor Company, the Maxwell-Briscoe organization advanced to the point where the plants, as follows, were put into substantially full swing.

PLANTS DEVOTED TO MANUFACTURE OF MAXWELL AUTOMOBILES

Location of Plant	Square Feet of Floor Space
Tarrytown (plant No. 1)	149,000
Tarrytown (plant No. 2)	160,000
Providence (Rhode Island)	125,000
New Castle (Indiana)	507,000
Total	941,000

After the formation of the United States Motor Company, the Columbia plant, at Hartford, was taken over, and in this way the floor space, as above set down, was augmented by 350,000 square feet.

DIVERSIFIED MECHANICAL EQUIPMENT

Not considering the Columbia plant for the present, it will be the purpose to indicate in a general way a few of the Briscoe ideas as they are actually carried out at the Maxwell-Briscoe plants under the direction of J. D. Maxwell. It is estimated that the workmen in the Tarrytown plant have substantially $100,000 worth of material undergoing operations at any moment in the day. The illustrations, with their explanatory captions, are but a few of the many which adequately indicate the advanced nature of the work and the wide variety of special machine tools employed in the process.

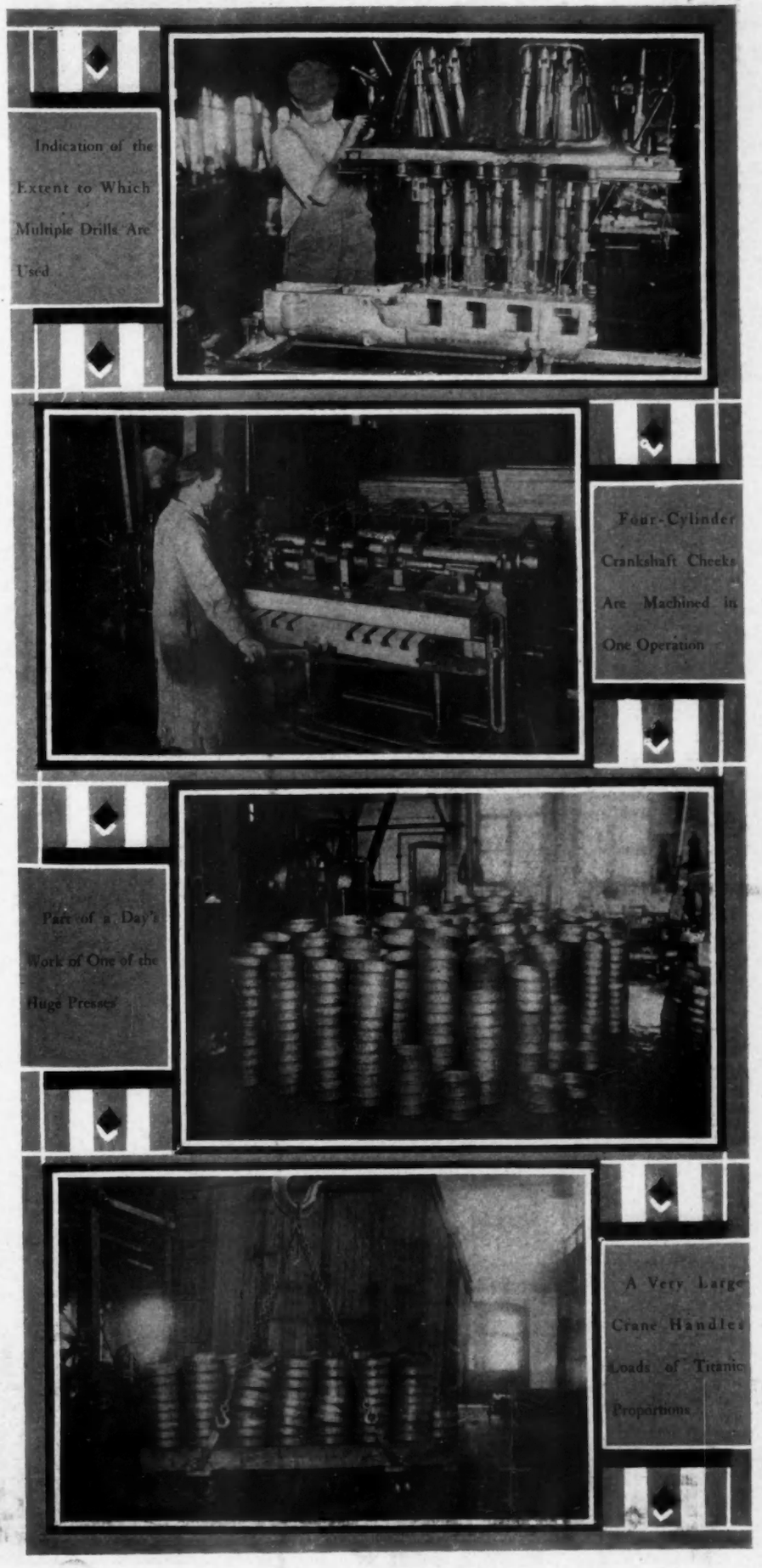
It would be difficult to describe the process as it is controlled by the system employed, without following it out step by step, at a considerable expense of time, study and space, but it will be possible to indicate in a general way the primal objects. To begin with, time and experience have adequately shown that a manufacturing concern, if the work is to be done with certainty on a large scale, must be on a self-contained basis. To answer this requirement plant No. 2, at Tarrytown, is fitted out with every possible facility, from the enormous presses which form the side bars, cross-members, brake drums and other parts of pressed steel, including pneumatic riveting machines, revolving jigs, and a di-

versity of miscellaneous equipment, to the forming system and facilities by means of which the metal bodies are quickly and accurately produced.

As an intermediate detail, the side bars, cross-members and small parts which go to make the chassis frame complete are dipped in an anti-rust solution and kept therein submerged until the material smears over and penetrates into every little crevice all over the surfaces, and this solution thus quickly applied also serves as the priming coat over which the finish is ultimately applied. In this relatively small detail will be found an illustration of the very method by which quality and a high rate of production are made to survive in unison.

In the same plant the foundry building occupies an extremely important level. It is a well-lighted structure, commodious in size, and the tilting furnaces, with oil burners, are of the most modern make, with a sufficiently numerous battery to turn out all the castings required, in view of the fact that pressed steel and drop forgings take precedence over other forms of material at every possible point in the makeup of the automobiles. The foundry has a considerable undertaking in turning out the castings as used in the carbureters, and in thus manufacturing its own carbureters, starting with the "pig" and ending in the nearby plant with its quota of automatic tools, the company presents the same absolute front that it does all along the line.

A famine of material, or the congested condition of parts makers, can have no bearing on the operations of this company; its sole outside source of trouble is centered in the purchase of raw material and this policy is carried to such a limit that Maxwell-Briscoe patrons are offered the advantages which come from a manufactured stock of repair parts, to whatever extent they may be in reasonable demand. A building in plant No. 2 is devoted exclusively to the systematic and proper storage of a reasonable number of the parts which go into cars of this make, and a system of accounting which has been worked out to a successful issue permits the parts storekeeper to quickly and accurately fill such orders for repair parts as may come in from time to time. The reserve building in which these repair parts are stored is fireproof, and was erected at quite a considerable distance from the surrounding buildings. From time to time the machine tools, if they run out of shop order work, are permitted to fill in on live repair parts, with the understanding that even if they are not used in repair work, they will ultimately find a place in regular cars, but in order to be able to do work of this character on a stock basis it has been necessary to standardize the automobiles and the component parts thereof, so that the risk of ultimately accumulating stale stock would be minimized.



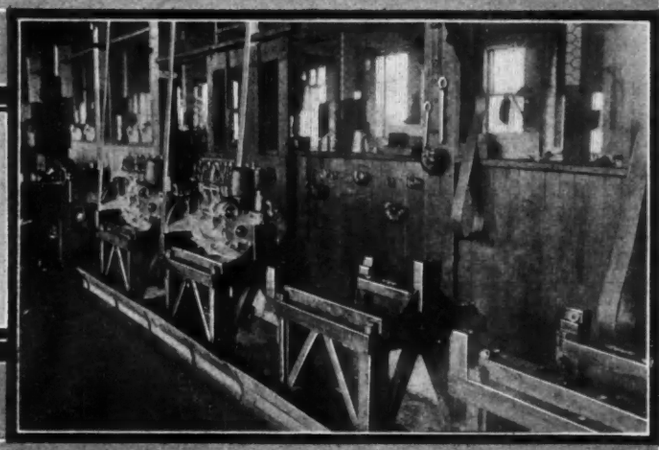
Indication of the Extent to Which Multiple Drills Are Used

Four-Cylinder Crankshaft Cheeks Are Machined in One Operation

Part of a Day's Work of One of the Huge Presses

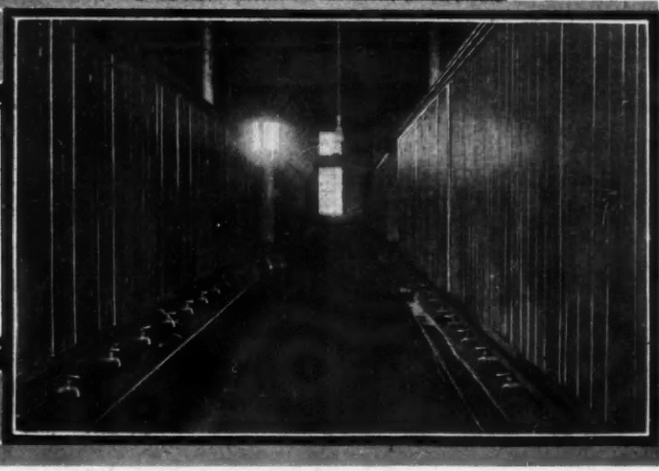
A Very Large Crane Handles Loads of Titanic Proportions

From View Gives Scant Idea of Columbia Plant's Size



After Assembling, All Engines Are Thoroughly Run In

Paint Shop Showing One-Half of Assembled Cars



Satisfied Employees Are Made by Properly Caring for Them

STANDARDIZATION PROBLEM SOLVED

In a large undertaking such as this it was one of the original Briscoe ideas to so cope with the problems of standardization that it would be safe to prepare for the quick and accurate production of parts on a large scale. In order to thus proceed it was necessary to definitely establish the exact design of all the parts, and then make jigs, tools, and fixtures which, together with special machine tools, would eliminate the personal equation and permit workmen to specialize for the best result. The enormous cost of the special tools, jigs, fixtures, etc., which were found to be necessary in this venture is the best guarantee anyone can have that immature designs would have been fatal to the project, and the growth and expansion of this industry lends a substance to the belief that forethought governed the divers acts which led to the methods of manufacture in vogue.

ARTISANS SPECIALIZE ON PRODUCTION

The old idea among machinists was that it took seven years to learn the trade, and that every workman should be capable of doing every possible operation involved in machining processes. The time was when "one-man power" obtained in manufacturing establishments, and each workman was called upon to know how to do every operation, thus making it possible for one man to direct everything. In these days, especially with plants in almost every industrial center in the country, the aggregate output of all combined, reaching into almost unreadable figures, the one-man power is centered in the great organizer, in this case Benjamin Briscoe, who depends upon a corps of trained executives, and they in turn place reliance upon an equally essential corps of departmental heads, who in turn engage the workmen and employ them in the capacity of specialists, so that the work is done day after day, and oftentimes year after year, in such a way that one man learns how to do some one thing, with never a thought or reason for wanting to do anything else.

The work is so grouped in the several plants that it transverses in the direction of the finished product from the source of supply as it is represented by raw material, and while inspection facilities are utilized as a checker against errors at important points in the process, the fact remains that errors do not accumulate because through the methods worked out a mistake cannot get beyond the man who makes it further than to the man who performs the succeeding operation.

Crankshafts will serve as an illustration of the automatic method of discovering errors. After they are cut off, centered, the cheeks milled and the pins ground, they go to the inspection department, and are there centered in a testing

machine which will develop any variation in excess of 0.0015 of an inch of a pin out of round. Notwithstanding the accuracy of this test, the crankshafts go to a run-in machine, where they are mounted in place, the bearings clamped down, and the shafts are given a run-in test for a sufficient time to ascertain as to their respective qualities.

Cylinders, after they are roughed, ground and tested for tightness, are set up in a fixture and placed upon the platen of a multiple spindle machine where they are completed in three separate operations by as many men. The work is done progressively, and should one of the men fail to perform with the exactness which is demanded, the next man in picking up the work would be likely to discover the discrepancy, but should he be so blind as to overlook a fault, the error will be for discovery by the third man in the series. The point uppermost in this progressive shop system is that no man completes a job.

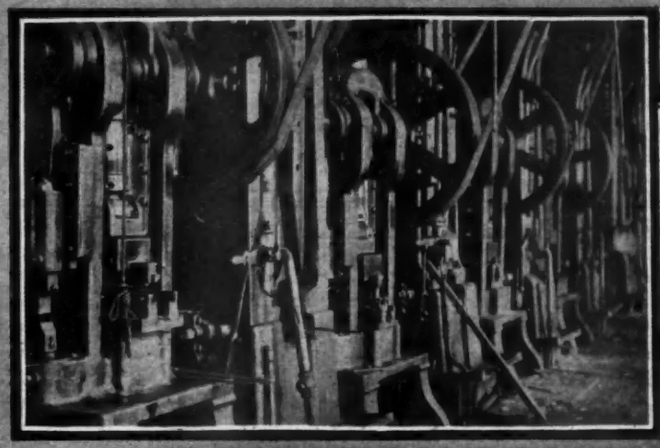
The component parts of the power plants, after they pass through the progressive method of manufacture, go to the assembling department, and, there, placed upon a "block" and the crankshaft is mounted into place; thereafter the clutch, flywheel and relating members are inserted, and if the rotating parts are free, and apparently in the right relation, the workman who performs this part of the work passes it along to the next man, who puts a belt over the flywheel, and from power, which is available, gives the assembly, in this incomplete state, a run-in test. After a sufficient time, if all goes well, the incomplete power plant is passed on to the workmen who apply the cylinders, insert the valves, and do such other work as may be necessary to advance the motors to a near state of completion. The substantially completed motors are then given a preliminary run-in test, and if they prove to be sufficiently promising they are then forwarded to the regular testing department, where, by means of calibrated fans, they are given their rated load and run for a sufficient time to assure that they will be in fettle to make it worth while to mount them into the chassis, there to receive tuning-up treatment, to be followed by a road test.

Columbia Plant Was Merged

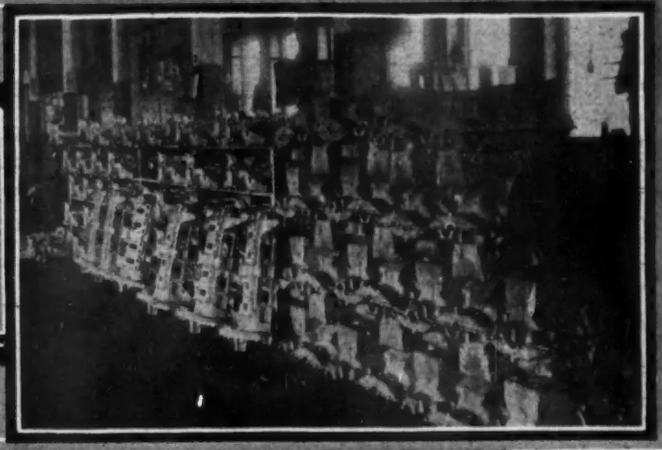
FACILITIES, far beyond the present and prospective future output of the Columbia Motor Car Company, at Hartford, Conn., formerly the Electric Vehicle Company, and now a component part of the United States Motor Company, are afforded by the factory as it stands to-day, both as to space, equipment, system of handling materials, and men.

(*Continued on page 693.*)

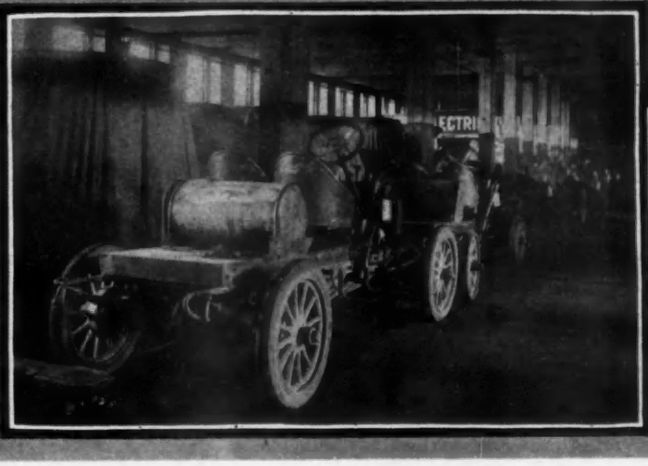
Rear Showing Room to Grow and Own R. R. Siding



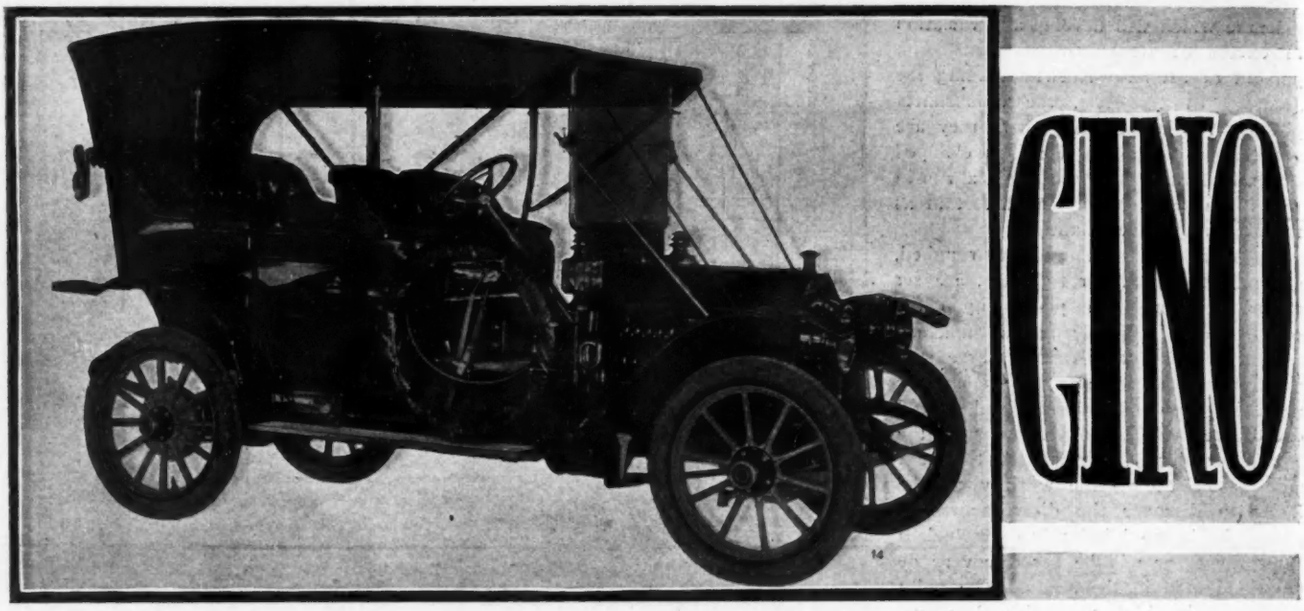
Part of Forging Equipment, Which is Unusually Complete.



Stock of Crankcases Finished and Waiting for Assembly.



Row of Tested Cars Awaiting Painting and Body



As a Touring Car the Cino, from Cincinnati, Displays a Number of Attractive and Meritorious Features

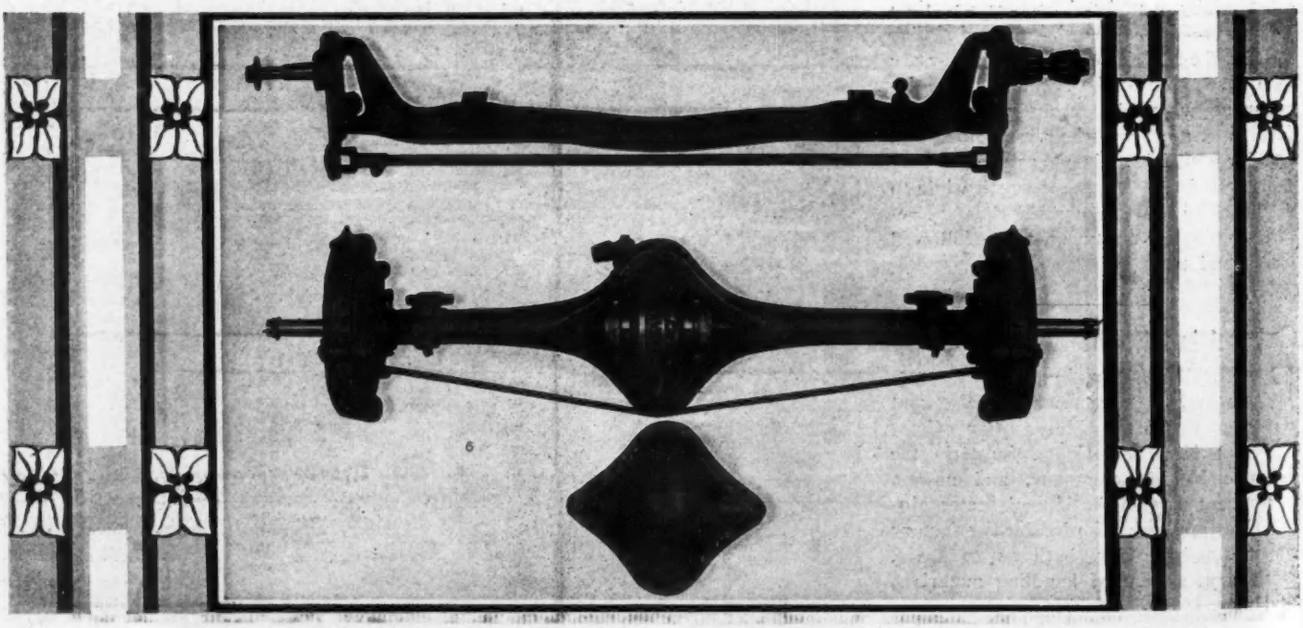
Haberer & Company, Offices and Factory at Cincinnati, O.

Motor, four cylinder, 4 3-8 by 5 inches; cylinders cast in pairs, with all valves in the head.
Crankshaft drop-forged and heat-treated; three bearings of Parson's white brass.
Ignition by Remy magneto, with dry cells as auxiliary.
Carbureter, Stromberg.
Lubrication by three-feed pump, maintaining a constant level in the crankcase.
Vertical tube radiator radiator with six-bladed belt-driven fan and centrifugal pump.
Multiple-disc clutch; 25 steel discs and nine springs, located in change-gear case.
Three-speed selective change-gear, carried on subframe.
Drive through shaft with two Spicer universal joints.
Rear axle full floating, with pressed steel housing; Timken roller bearings.
Internal and external brakes on rear hubs, former the emergency and latter the foot brake; bands faced with Thermoid.
Front axle made by Timken; weldless drop-forging, I-section.
Worm-and-sector steering gear with 18-inch hand wheel.
Wheels 34 inches in diameter, 10 spokes front and 12 rear; 34 by 4-inch Diamond tires standard.
Front springs semi-elliptic, 36 inches long; rear springs three-quarters elliptic, 46 inches long.
Pressed steel frame with four cross-members and subframe.
Wheelbase 113 inches; weight about 2,550 pounds; price with touring body, $2,250, including five lamps and gas generator.

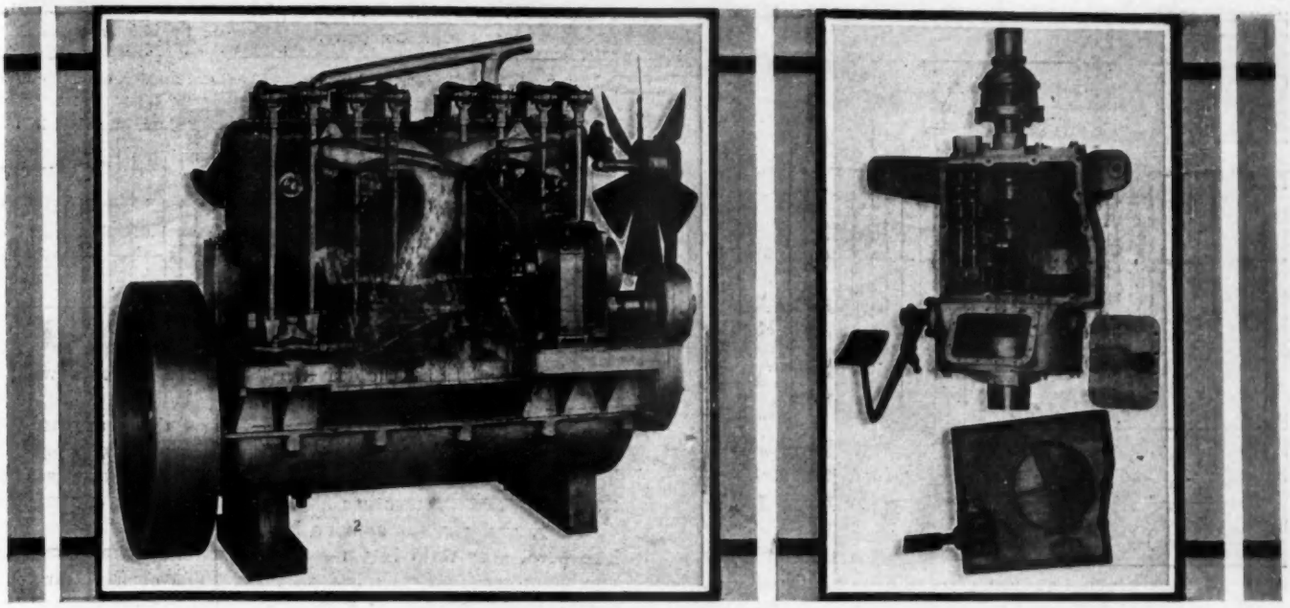
CINCINNATI'S reputation as a manufacturing city, especially in the line of machine tools, at least equals that of any other city in the country. Until quite recently, however, the Queen City's part in the automobile industry has been only to make the tools with which other cities made the cars. For the 1910 season an even half-dozen makes of automobiles will bear the Cincinnati impress, and of these one of the most important is the Cino, the product of Haberer & Company.

In most respects this car follows conventional lines of design. The motor, rated at 40-horsepower, the multiple-disc clutch and the three-speed selective change gear are made in Haberer & Company's factory on the designs of the company's engineer. The axles are of Timken construction, of well-known excellence.

Four cylinders, 4 3-8 by 5 inches, cast in pairs, and a three-bearing drop-forged crankshaft form the basis of the motor design. All valves are in the cylinder heads, in a single row, and



Cino Axles Afford the Solidity Necessary to Support a 2,500-pound Car with Its Full Passenger Load



Motor and Change-Gear Are Both Products of the Haberer Factory; the Latter Includes the Clutch

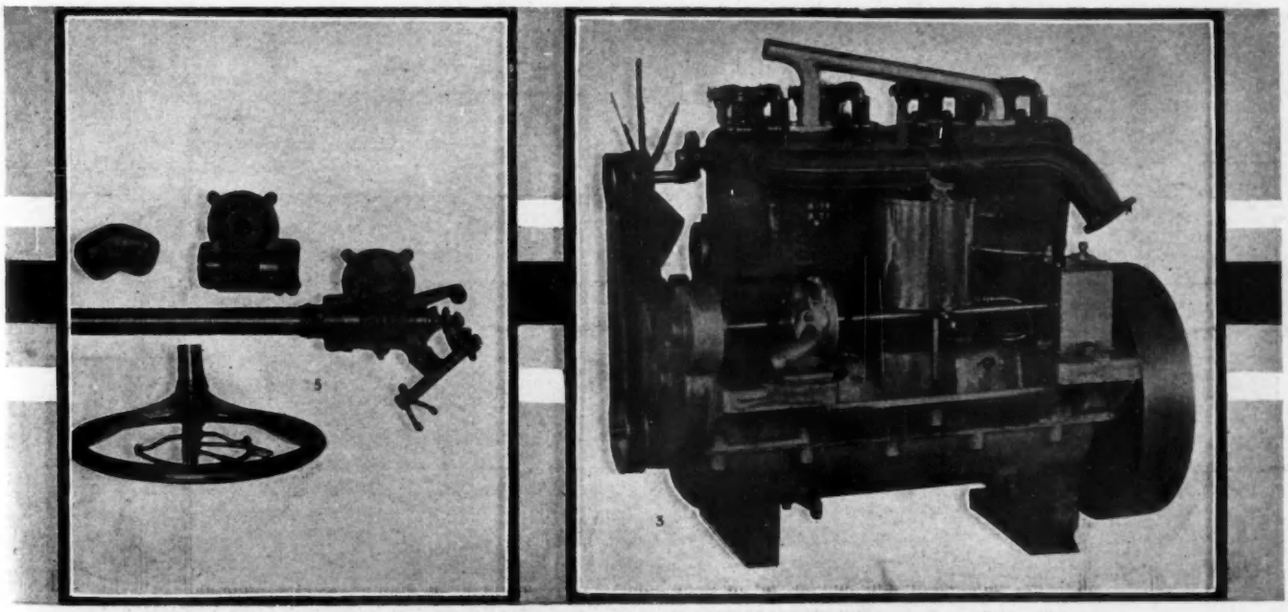
are actuated through rockers and push-rods from a camshaft enclosed in the crankcase on the right-hand side of the motor. They are unusually large in size, with heads of nickel steel, and vanadium steel springs, the latter being subjected to a treatment which gives them long life. The valves and their cages are easily removable for cleaning and grinding. The camshaft is a drop-forging with cams integral, and cams, push-rods and rollers are all hardened and ground.

The crankshaft is a drop-forging, of liberal size, heat-treated for toughness and strength, and journals are ground to size. Die-casting of the bearings, of Parson's white brass, insures an even texture and wearing qualities. Castings of an aluminum alloy form the two halves of the crankcase, which has integral four arms by which the motor is supported on the subframe.

The arrangement of the motor accessories shows careful thought. The inlet piping is carried over to the right side, and with it, of course, the carbureter. The magneto is also located on this side, at the extreme front of the motor. The exhaust manifold is on the left side, and with it the water and oil pumps. These are on a common shaft, which passes through the pump and extends to the oiler mounted on the rear lug of the crankcase. Oil is carried in a large cylindrical tank set in close between the cylinder pairs, and is fed from the pump through sight feeds on the dash leading to the crankcase and clutch. A constant level is maintained in the former, and the cylinders are kept lubricated by the splash.

Clutch and change-gear are united in a single case, with connection to the motor through an Oldham coupling of good size. The clutch has 25 all-steel discs, under the pressure of nine springs of the same vanadium steel used for the valve springs. The shafts and gears of the change-gear are of substantial design and run on plain bearings. The sliding-gear shaft has milled splines, a commendable feature. The lay shaft has one bearing between the constant-mesh gear and the second-speed gear, the former being overhung; this is believed to give a better distribution of the stresses. Drive is through a shaft with two Spicer joints, the angle of the joints not exceeding three degrees.

The rear axle is live and with floating shafts; the axle body is pressed steel, and the differential and bevel gears are carried in an easily removable cage.



Cylinders Cast in Pairs, with Overhead Valves, Distinguish the Motor; Steering through Worm Gear

Showing Tubular Axle with Connections Well Protected

Sales Agents, Meixell-Downing Company, Indianapolis. Made by Clark Motor Car Company, Shelbyville, Ind.

Motor, four-cylinder, 4 by 4 inches.
Cylinders cast separately.
All valves on the left side.
Crankshaft drop-forged with five plain bearings.
Ignition dual; Remy magneto with separate coil.
Dry batteries on same set of plugs.
Carbureter, Schebler.
Gasoline tank under front seat, gravity feed, capacity 14 gallons.
Constant level splash lubrication.
Cooling by vertical-tube radiator with pump and belt-driven fan.
Leather-faced cone clutch, 15 3-4 inches diameter, 2 1-2 inches face.
Drive by shaft enclosed in torsion tube.
Single universal joint.
Change-gear on the rear axle, selective type.
Three speeds forward and reverse.
Annular ball bearings in change-gear.
Semi-floating rear axle; bevel gear ratio 3 1-2 to 1.

AMONG the additions of the past season to the automobile plants in the vicinity of Indianapolis, and adding to the prestige of that city as a center of the automobile industry, is that of the Clark Motor Car Company, at Shelbyville. This company has put on the 1910 market two models, of 30 and 40 horsepower, and selling at $1,400 and $1,750, respectively, for which the Meixell-Downing Company, of Indianapolis, acts as general sales agent. The two models resemble each other in most essential features, but the present article will treat of the Clark "30" exclusively.

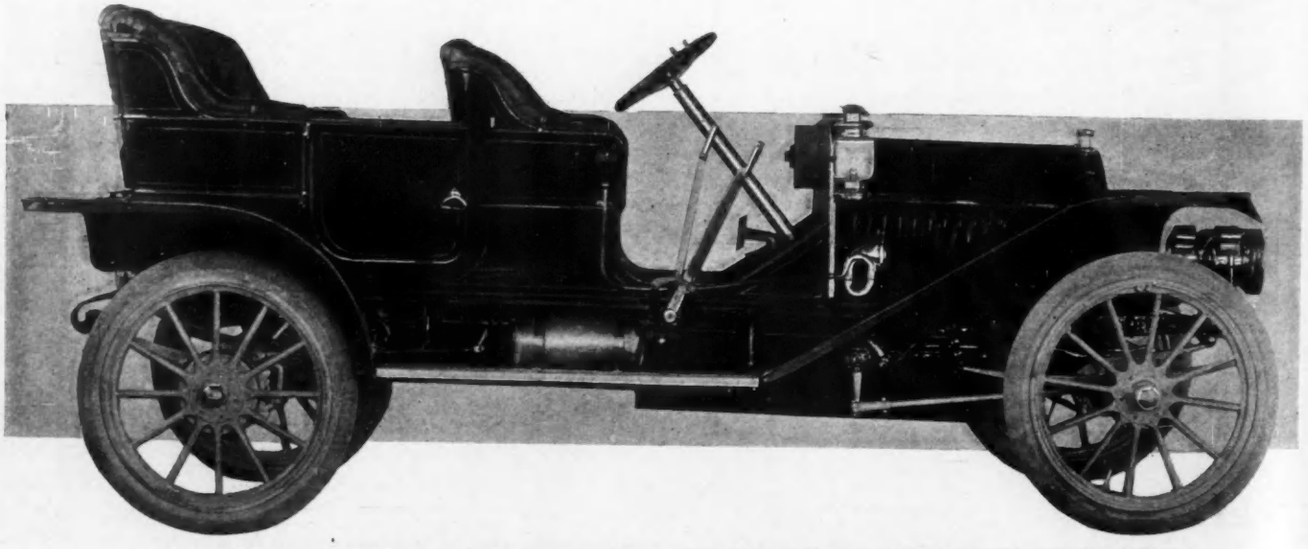
As in any form of engineering work, a substantial foundation is the first requisite of a successful automobile. The designer of the Clark seems to have given especial attention to the chassis of his car. The frame is of pressed steel of the conventional channel section, 1 1-2-inch flange, and 3 1-2 inches deep for the middle half of its length; it has three cross members, the front and middle ones carrying between them a subframe for the support of the motor. The comparatively long wheelbase—112 inches—allows a minimum of overhang, the frame extending but 6 inches back of the center of the rear axle.

Rear-seat passengers will appreciate not only the lack of excessive overhang, but also the policy which caused the rear end of the frame to be hung on full elliptic springs of the double-scroll type 40 inches long. The front springs, as usual, are semi-elliptic, and the leaves of both are 2 inches wide, a generous figure for a 2,000-pound car.

The semi-floating type rear axle carries the gear case, according to the fashion which is steadily gaining in popularity. The axle is built up of tubular sleeves and a central case for the bevels and differential; the live shafts are 1 1-4 inch in diameter, and run on annular ball and Hyatt roller bearings. The bevel gear ratio is 3 1-2 to 1, which is figured to give a maximum speed of 50 miles an hour. The change-gear gives three speeds forward and reverse, controlled selectively; the gears are a special grade steel, and the shafts run on annular ball-bearings throughout.

Torsional strains are taken up by a stout tube enclosing the drive shaft and bearing on its forward end a wide yoke, the arms of which are hinged to the subframe. Thus the drive shaft and its universal joint have only to transmit the power of the motor to the rear axle, instead of carrying these strains, as in some designs they are called upon to do. The clutch is a leather-faced cone, 15 3-4 inches in diameter and 2 1-2 inches face, and so arranged that its engagement is cushioned not only by springs under the leather, but also by the air entrapped between it and the flywheel.

For the motor recourse has been taken to one of the oldest and most reliable of the stock products, the Rutenber. The features of this motor are familiar to every automobilist. The one used in the Clark "30" has four cylinders 4 by 4 inches, cast separately, of course, and with a five-bearing crankshaft. One of the more recent details is the provision of a vertical shaft at the front of the motor, driven from the crankshaft by skew gears, which carries the timer on its upper and the oil pump on its lower end, and drives the magneto through another pair of skew gears. The magneto is a Remy, three-magnet type, and dry batteries are provided for starting.



Clark "30" Has a Well-Balanced Appearance, Due to Location of Body and Hood on a Long Wheelbase

Live shaft 1 1-4-inch diameter; annular ball and Hyatt roller bearings.
Internal and external brakes on rear hubs.
Foot brake external, emergency brake internal and equalized.
Brake bands faced with Raybestos.
Front axle tubular ball bearing.
Steering gear, worm-and-sector.
Hand wheel 16 inches diameter.
Wheels 34 inches diameter, 12 spokes.
Standard tire equipment 34 by 3 1-2-inch Fisk.
Front springs semi-elliptic 38 by 2 inches, 5 leaves.
Rear springs full elliptic, double scroll, 40 by 2 inches, 6 leaves.
Pressed steel frame, channel section.
Greatest depth of frame, 3 1-2 inches, 1 1-2-inch flange.
Three cross members with subframe to carry motor.
Wheelbase, 112 inches.
Road clearance, 11 inches.
Weight, 2,050 pounds with full tanks.
Price with touring body, $1,400, including five lamps and gas tank.
Standard color, Russian blue.

Rear View Discloses a Substantial Axle and Springs

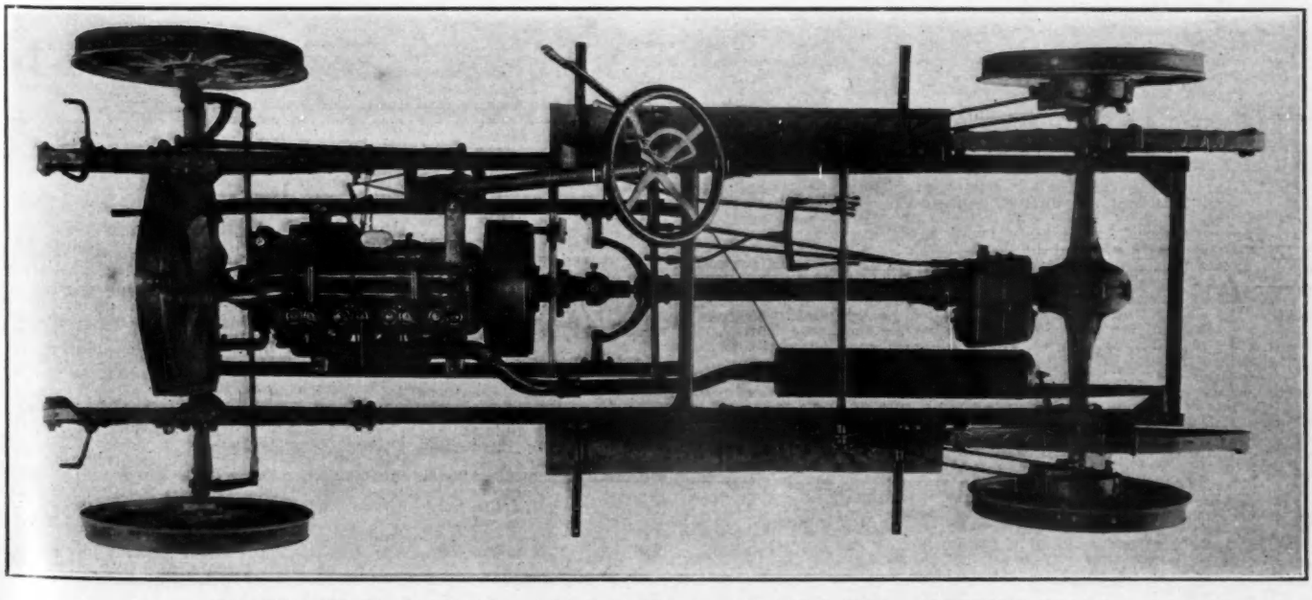
Control methods follow the accepted standard. Spark and throttle levers are mounted on top of the steering wheel, and an accelerator pedal is also provided. The worm-and-sector steering gear has a 16-inch wheel mounted on a brass column 1 7-8 inch diameter. The change-gear lever, working on an H-shaped quadrant, and the emergency brake lever are side by side; the latter pulls back to apply the brakes, and has a button release. The left foot pedal releases the clutch, and the right pedal applies the service brakes, in the accepted fashion. Both sets of brakes are on the rear hubs, the emergency set being the internal and the service the external one. The emergency brakes are equalized by a balancing bar introduced in the connections. The bands are lined with Raybestos, the wearing parts are protected from dirt, and the adjustments are readily accessible.

A good degree of noiselessness in operation has been secured by enclosing the moving parts which are responsible for most of the usual noise, and by providing a large muffler, of a capacity to take care of the exhaust gases without setting up undue back pressure. A cut-out, operated by a foot pedal, is provided for speeding.

Thorough provision is made for lubrication of all wearing parts. The motor has its own lubricating system built integral; a pump, driven by a vertical shaft at the front of the motor, as mentioned above, keeps a constant stream of oil flowing to the crankshaft bearings, and maintains a constant level in the four crank pits, from which the oil is splashed into the cylinders. The motor has a large filling cap on the right-hand side of the crankcase. All bearing points on the chassis are provided either with grease cups or with Winkley oilers. Oil holes are believed to be worse than useless for automobile service, as they only catch grit, which is then carried directly into the bearing surfaces. The gearcase is filled with oil, and the bevel gearcase of the rear axle is packed with hard grease, these parts needing but occasional attention.

The standard five-passenger touring body affords ample accommodation for its rated number of passengers, and owing to the length of the wheelbase the rear seat overhangs the axle much less than usual, thus adding to its easy-riding qualities. The rear seat is 47 inches wide and 20 1-2 inches deep; the height from the floor to the top of the cushion is 15 3-4 inches, and the leg room is 22 1-2 inches. The width of the front seat is 39 1-2 inches, and its depth 19 inches; the height 15 1-2 inches, and the leg room 27 1-2 inches. The body is of metal, ironed for top, with dash and molding in cherry finish.

Russian blue with narrow gold striping is the standard color for body and chassis, with wheels of light gray, making a pleasing combination. The upholstering is tufted, with good quality leather, hair and springs. Mudguards of ample width, with sheet metal aprons between the frame and running boards, insure against annoyance from dust and mud. With its 112-inch wheelbase and 34 by 3 1-2-inch tires, besides the complete equipment offered, the Clark "30" seems unusually good value.



In this View May Be Observed the Yoke on the Torsion Tube Which Relieves the Universal Joint

A. A. A. GIVES OUT 1910 GLIDDEN TOUR RULES

RULES governing the 1910 National reliability tour of the American Automobile Association for the Glidden and Chicago trophies are as follows:

The seventh annual reliability tour for the Glidden trophy for touring cars and the Chicago trophy for runabouts and miniature tonneaus will start at Cincinnati on June 15, 1910, and end at Chicago June 29, 1910, including Louisville, Nashville, Memphis, Little Rock, Texarkana, Dallas, Fort Worth, Oklahoma City, Wichita, Topeka, Atchison, St. Joseph, Des Moines, Cedar Rapids, Davenport, Rock Island and Moline.

TROPHY AWARDS

The trophy in each class shall be awarded to the entrant whose car completes the contest with the least number of points to its debit. See general rule 526.

In case of a tied score for the Glidden trophy or for Chicago trophy, the trophy will not be awarded, but suitable medals will be issued to the cars so tied, certifying that they have qualified as winners, and their names shall be properly inscribed upon the respective trophies.

Cars completing the contest with 97 per cent. of the winning score shall be awarded Glidden certificates setting forth in detail the performance of the car on the road and its condition upon final examination. Rule 525.

CLASSIFICATIONS AND ELIGIBLE COMPETITORS

Each entrant shall be a member of the A. A. A. or of an affiliated club.

Stock cars only shall be eligible to compete and shall be divided into two classes according to body equipment: 1—Touring car class; 2—runabout class, including runabouts, miniature tonneaus, surreys and double or single rumbles. Rule 403.

Any stock touring car, a complete description of which has been filed by the manufacturer with the contest board of the American Automobile Association, at least 30 days prior to the date of the tour, as provided in rule 32, shall be eligible to compete for the Glidden trophy.

Any stock runabout, miniature tonneau, surrey, double or single rumble, a complete description of which has been filed by the manufacturer with the contest board of the American Automobile Association at least 30 days prior to the date of the tour, as provided in rule 32, shall be eligible to compete for the Chicago trophy.

CAR EQUIPMENT

404—Each competing car shall be delivered into the custody of the promoter's technical committee for official examination before the start of the contest, at the date required by the committee, which shall be specified upon the entry blank to determine if it is a stock car and regularly equipped.

405—Each car must carry at all times during the contest its catalogued equipment of lamps, tools, tire tools, body, fenders, sod pan, running boards, muffler and body parts; and, in addition, may or may not use windshield, top, extra tires, baggage rack, lamp bumpers and supplementary tonneau seats.

406—Special mud aprons may be used in front of the radiator or bonnet screens between the side members of the frame, same to be attached before the start of the contest in a manner satisfactory to the technical committee.

407—Rubber bumpers for springs and rebound straps may be used without penalization for trouble with them.

408—Tire-inflating tanks of any nature may be used.

409—Cars are not permitted to use searchlights unless same are part of regular equipment, but may affix two ordinary gas or electric lights with generator or gas tank.

410—Covers over coil boxes on the dash, or wherever located, not permitted unless regularly provided.

411—Leather or other covers over magnetos not permitted unless supplied regularly with stock cars. This applies to any other part of mechanism as well.

412—Screenings or shields of any construction around carbureter not permitted unless regularly fitted to stock cars.

413—The cotter-pinning, or lock-nutting of nuts or riveting of bolts or studs, other than is regularly done on stock cars at the factory, not permitted.

414—The use of special springs or spring windings not permitted.

415—Shock absorbers will not be permitted unless listed under regular, optional or special equipment.

PASSENGER LOAD

416—A touring car shall carry four or more persons.

A miniature tonneau, surrey, or runabout shall carry two or more persons.

Passenger load in all body types must average 125 pounds per person or a like amount in ballast.

RESPONSIBILITY OF ENTRANTS

1—Each entrant by his signature to the entry blank shall agree that he is familiar with the rules, that he will abide thereby and accept the official records, and authorize the American Automobile Association to publish them in such manner as it shall determine.

2—Each entrant shall hold the American Automobile Association harmless and indemnify it against all loss or damage resulting directly or indirectly from or growing out of the operation, management or control of the car entered by him.

3—The American Automobile Association shall not be responsible for any damage that may be done to any car, its passengers or contents during the tour, nor for the theft of any car or any of its accessories or contents, the same being at all times subsequent to such entry, and until the close of the tour, at the risk in all respects of persons entering same.

4—Each entrant or his official representative shall be responsible for the acts of passengers in his car.

5—Each competing car must be delivered into the custody of the committee before 9 o'clock on the morning of Monday, June 13, for official examination and to check the inventories of parts carried as hereinafter provided for.

6—Each entrant shall name an official representative for each of his entries, on or before June 1, 1910, failing which the driver of the car shall be considered the official representative. Rule 426.

7—The official representative of the entrant shall be subject to all rules and penalties prescribed for the entrant, and shall be considered as the entrant in fact. Rule 427.

ENTRIES

1—The time for receiving entries shall expire on June 1, 1910, at 12 o'clock midnight, at the office of S. M. Butler, chairman contest board, 437 Fifth avenue, New York. Each entry must be accompanied by the entrance fee. Rule 432.

2—Each entrant shall give all details asked for in the entry blank and such additional information as the contest committee may from time to time require.

3—The contest committee of the American Automobile Association reserves the right to refuse any entry.

4—Entries shall be numbered in the order of their receipt. Rule 428.

428—Upon making an entry, each entrant shall appoint one observer for each car entered. See Rule 465.

429—No more than three cars of any one make may be entered in either of the body equipment classes provided in Rule 403.

430—The entry fee will not be refunded in case a car fails to start or is disqualified during the contest, or in any case, unless the contest is for any reason abandoned.

433—Any attempt at fraud in the evasion of the stock car definition or status of the car on the part of an entrant shall disqualify the car, the driver and the entrant.

TOOLS

417—All tools for the car will be carried in a special tool bag furnished by the promoter, which shall be sealed and handed over to the observer, and the use of tools other than those carried in the bag is prohibited. The number of tools is not limited to the supply sold with the car. When tools are needed the driver or mechanic will obtain them from the observer, who will keep a strict account of the number of tools used and see that they are returned to him at completion of work. Tire tools may be carried in the regular tool compartment of the car, but must not be placed in the official tool bag.

INVENTORY OF PARTS

418—Each entrant shall furnish prior to the start an inventory of all parts carried in his car, and these shall be officially checked, sealed and a record made of same.

TIRES

419—Each entrant may carry as many tires, demountable rims and tire chains and the parts which secure them in place as desired, or purchase or obtain them en route without penalty.

TIRE REPAIRS

420—There shall be no penalty for tire repairs, provided the engine be kept running while the repairs are being made and no other work is done. The time consumed in making the repairs, while the engine is running, shall be added to the day's running time.

420A—The rule applied to tire repairs also applies to removal repairs, also anti-skid.

LUBRICATION EQUIPMENT

423—No additional lubrication equipment, such as pumps for forcing oil direct into crank case, will be allowed, unless cars are regularly sold with such equipment.

THE ROUTE

434—The route shall be exactly marked by one or more of the following methods:

A—By throwing confetti on the right side of the road 100 yards before and 100 yards after any turn. On long stretches, without turns, occasional throwings, especially at points 100 yards after passing any corner where a turn has not been made.

B—By providing each contestant with a description of the route, giving explicit directions of all right and left turns and right and left forks, and with occasional references to some conspicuous object. Mileage distance shall be placed to the left of each of these points noted in the route descriptions.

C—By marking the course with arrows and disks, the arrows to be placed 100 yards before a turn and the disks 100 yards after a turn. Disks shall also be placed 100 yards after passing any corner where a turn has not been made.

PRELIMINARY INSPECTION

435—Contesting cars shall be given a preliminary inspection preceding the start of the contest. At this inspection one representative of the entrant will be present with the technical committee of the promoter. An inspection card showing the condition of wheels, springs, frame, front and rear axles, steering pivots, steering gear, body, motor, ignition parts, lubricating parts, cooling parts, carburetion parts, exhaust parts, clutch parts, transmission and control parts, brakes and brake-operating parts, etc., will be filled out and any noticeable points about each that might later occasion dispute, recorded. This card must be attested by the entrant's representative.

SEALS

436—Metal and wire seals will be affixed by the technical committee as follows:

Gasoline Cars—Bonnet, coil box, transmission case, differential case, mud pan or apron and parts of ignition not beneath bonnet or protected by bonnet seals, and any other parts at the option of the promoter's technical committee. Where motors are under the body of the car, the floor, seat and deck boards must be suitably sealed.

437—Steam Cars—Bonnet, mud pan or apron, pilot light, thermostat, flow motor regulator and parts of steam system not beneath the bonnet and not protected by bonnet seals, and any other parts at the option of the promoters' technical committee.

(Continued on page 691.)

THE CARBURETER, ITS ADJUSTMENT, AND THE NOVICE

By HERBERT L. TOWLE

WATER-JACKETING of carbureters is resorted to for the opposite reason which makes it desirable on the motor cylinders, that is, to replace the heat lost in vaporizing the fuel, a small stream of hot water being by-passed around them from the cooling system of the engine. Carbureters not so provided take a portion of their air from a heater, connected usually to the exhaust manifold. The proportion of hot air can be regulated to suit the season. It follows that in winter when starting from cold much of the gasoline spray is not evaporated, or if evaporated is not properly mixed with air, and, therefore, passes through the engine unburned. For this reason it is usually necessary in cold weather to increase temporarily the gasoline supply till the engine warms up. This is sometimes facilitated by putting one of the carbureter adjustments under the driver's control by connecting it to a lever on the back of the dashboard.

The same fact, i.e., that cold gasoline does not evaporate freely, explains the need of flooding the carbureter to start in cold weather. Sometimes it is even necessary to warm the carbureter by pouring hot water over it or wrapping it in hot wet cloths. A good modern carbureter requires little or no priming in warm weather, as the suction due to cranking is sufficient to draw gasoline from the spray nozzle. If, however, "priming" is necessary, the user must learn by trial about how much to prime for different conditions. If the engine is warm, none is required. If it has stood over night or longer, the carbureter can usually be flooded until gasoline drips from the overflow outlet provided for that purpose. Too much gasoline, however, is as bad as too little. A strong spark will help matters considerably. If the user has a magneto he may count on a very weak spark when cranking with the spark lever retarded. The common dual ignition provision, i.e., a magneto for regular service and a battery and outside coil for starting, is intended for just this condition.

Incidentally the reader is cautioned to make a practice of shutting the main gasoline valve after every run. Carbureter float valves are notoriously prone to leak. While the engine runs, the gasoline consumption takes care of the leakage, but over night the leakage may not only flood the carbureter so as to render starting difficult, but waste gasoline seriously as well. If the engine balks owing to flooding, shut the main gasoline valve and turn the crank vigorously several turns to pump out the saturated air; when the engine starts, turn on the gasoline. In extreme cases it may be well to open the float chamber drip cock and draw off some gasoline to lower the level. This, however, is seldom necessary except with puddle type carbureters, of which mention will be made in the next article.

New let us consider carbureter derangements and their symptoms. Of these the following are most common: Clogged gasoline pipe or passage, dirt in spray nozzle, water in gasoline, leaky float valve, loosening of threaded adjustment in float valve, gasoline-filled float, sticking air valve.

Occasionally the gasoline pipe or strainer will be clogged by fluff which comes through the pipe and lodges in or near the union connecting the pipe to the carbureter. The symptom is misfiring followed by total "dying" of the engine. If the stoppage is only partial, enough gasoline may get through to permit restarting, followed presently by the same performance. If gasoline does not flow freely when the float is depressed, first open the sediment plug. If gasoline comes out freely the trouble is higher up, possibly in the float valve orifice. If careful poking with a wire does not bring the obstruction down, take out the float valve and poke down from above. In some cases it may be necessary to disconnect and remove the carbureter to get at the obstruction. If the latter is lodged in the gasoline pipe or union, gasoline will escape, after opening the sediment plug, only till the float chamber is empty. Disconnect the union, and if still no gasoline comes, disconnect the pipe at the tank end after first closing the main valve next to the tank. If the pipe is clear the obstruction may be located in the main valve itself, or in the entrance to the pipe from the tank. Usually the latter can be reached and poked out either from inside the tank through the filler opening, or from beneath. Before embarking on the above hunt, be sure that the tank itself is not empty.

The symptoms of dirt in the spray nozzle are quite similar to the foregoing, except that gasoline issues freely at all points except from the nozzle when the float is depressed. A fine wire will locate the trouble, but the nozzle should be flushed clean.

Water in the gasoline will cause the motor to stop absolutely dead. Open the sediment plug and float chamber, drain plug, and see whether gasoline or water issues. Be sure that the water is thoroughly expelled from carbureter and pipe. If the gasoline is strained through a chamois skin or through several layers of cheesecloth, any water will be separated out.

The sign of a leaky float valve is dripping. Pressing the float valve shut does not stop the leakage; this will distinguish leakage from faulty adjustment. The remedy is to grind in the float valve with pumice stone, taking care to keep the stem central.

Occasionally the threaded adjustment of the float valve may work loose, allowing the needle portion of the valve to settle downward and shut off the gasoline, regardless of the position of that portion of the valve against which the float lever operates. The symptoms resemble those due to an obstructed gasoline pipe, except that gasoline flows freely from the drip cock.

A cork float is apt to absorb gasoline gradually, making it heavier, so that it fails to close the float valve when the normal gasoline level is reached. This results in leaking easily mistaken for that due to imperfect seating of the float valve, except that it is stopped at once by pressing the float valve against its seat. A temporary remedy is to readjust the float. For a permanent remedy the float must be taken out, baked to expel the gasoline, and given two coats of shellac. A hollow metal float sometimes receives an invisible puncture, which causes it to fill gradually with gasoline and act like a saturated cork float. By warming it the gasoline will be expelled as vapor. Plunging the cold float into warm water will cause bubbles to issue, showing the location of the leak. When dried out and cold the leak should be carefully soldered up, using no more solder than necessary in order not to increase the weight of the float.

Dirt may cause the auxiliary valve to stick—a point easily tested with the finger. The valve seat, if not of metal, may leak, causing a weak mixture at low speeds.

While on the subject of float valves it may be noted that there are five methods of controlling these valves, as follows:

1. By direct attachment of the needle to the float itself, so that closure is accomplished by the upward movement and pressure of the float.

2. By indirect action through a lever, which multiplies the pressure available to hold the valve shut.

3. The valve may be loaded, so that it shuts off the gasoline by its own weight. The float in that case operates to open the valve when the gasoline level falls, rather than to force it shut when the level rises. This device has the advantage over the preceding, that vibration of the float is not so likely to be communicated to the valve, and the latter is more likely to hold tight.

4. The valve may be closed by spring pressure instead of simply by its own weight. This makes it still more secure against opening from vibration. The float acts as a counterbalance as in case 3.

5. The valve may be weighted and spring tension added to steady it. This is perhaps the best system of all.

By noting which of the above devices is used in his own carbureter the reader will be able to judge whether leakage is due to imperfect seating of the valve or to a fault inherent in the valve's design.

DO WE SEE OURSELVES AS OTHERS SEE US?

By JAMES S. MADISON

WHEN the average motorist, like you and me, has returned from a trip of 100 miles, or one of greater or less distance, in talking it over with his friends or family, he devotes, consciously or unconsciously, a certain proportion of his remarks to the "other fellow."

It is clear that the other fellow does many things he ought not to do and leaves undone many things he ought to have done, and in the slightly modified words of the prayer-book, there is no health in him. Whether the proportion of the remarks devoted to this subject is large or small, depends upon the mental attitude of the speaker and upon the behavior of the other fellow.

It is undoubtedly true that many of us have ample cause for annoyance, just as there are many of us who are quick to take offense and quick to resent real or supposed violations of our rights. There are also many of us who are thoughtless and inconsiderate and who undoubtedly give cause to the non-motoring public for condemning automobiles and their drivers in general.

Judging from a somewhat extended acquaintance among motorists, I do not believe that as a class they are more selfish, or less courteous or considerate of others, than any other class of persons. But as in other cases, the whole membership suffers for the acts of a few. No sane person thinks of condemning the whole legal fraternity because he knows of a few unprincipled lawyers; or the whole medical profession because he is aware of the existence of incompetent doctors. There is equally good reason for not condemning the motoring world in its entirety, because of the acts of a small portion of it.

DUTY OF ALL MOTORISTS TO HELP

Each member of this world, every person who sits behind the steering wheel, no matter what his color or how humble his station, has it in his power to do a real kindness to many people —autoists and non-autoists—every time he goes out on the road. He has it in his power to increase or lessen the prejudice existing in many localities against the automobilist. Every time he drives through crowded streets, he has the opportunity of showing whether he is a thoroughbred or a scrub; of making friends or enemies.

If we could all decide before starting on a trip, that we would not only avoid injuring any animal, property or person, but that we would not interfere with any creature's rights, pleasure, or comfort, we would all be happier. Our cars would run more smoothly, more sweetly, for courtesy is the best lubricant on the market and the "other fellow" would soon disappear.

I have been impressed with the fact that motorists are often thoughtless when passing other cars, horse-drawn vehicles or pedestrians on a dusty road. If one is going along at any speed above 16 or 17 miles, he is leaving a dense cloud of dust behind him and if he meets another automobile coming from the opposite direction, he may feel absolutely sure that the occupants will get the full benefit of it. If he has any doubt about this, let him turn around the next time he passes anyone on a dusty road and see for himself. It may be that owing to the size of the tires, shape of the car's body, etc., his car may not raise much dust at the speed mentioned. If it does not, so much the better, but should he increase his speed to 20 or 25 miles, he will bring into existence a cloud of dust that will fill eyes, nostrils and lungs and cover entirely the person of any one unfortunate enough to encounter it.

PRACTICABILITY OF THE GOLDEN RULE

To the occupants of automobiles it is bad enough, although they are exposed to it only for a few moments, but to those of our fellows who are on foot, or are riding behind horses it must be maddening. By far the worst of, it could be avoided by slowing down to a non-dust raising speed. Every driver ought to know at what speed his car raises dust. If he does not, he ought to find out the next time he encounters a dusty road. If he will make a few simple observations on his car's ability to raise dust, he will probably get a new conception of what a pest he may be under certain conditions.

I never feel like blaming the farmer, driving horses which are drawing a heavy load, for not showing any great enthusiasm or alacrity in turning out at the sharp honk of the horn. It may be that he has already turned out two or three times in a mile and if the distance is five miles to his home, probably he has been honked at ten or fifteen times. If the road is dusty and the day windless, he has been enveloped in ten or fifteen clouds of irritating dust. Is it any wonder, then, that when he reaches home he is in a belligerent frame of mind? My plea is that each of us should remember him and contribute as little as possible to his discomfort.

Personally, I think it is courteous and therefore good policy to give some sign of appreciation when passing the man who has turned out for me. A friendly nod, informal salute or a simple wave of the hand creates good feeling. While it is true that the law requires him to turn out, that is no reason for unwillingness to acknowledge the fact that he is obliging us at some inconvenience to himself.

Another factor in bringing us ill-will is the warning signal with which the cars are equipped. This is due to the kind of signal, our manner of using it, or both. In order to demonstrate that the signalling devices possess the property of rousing one's ire, let a car owner select any road much traveled by automobiles and run his car over it for several miles at a low speed. He will find that the methods used by his brother motorists when they wish to pass him, vary widely.

VARYING MESSAGES OF THE HORNS

Some signal in loud peremptory tones; some will toot the horn a dozen times; some only once or twice. Some will seem to say: "Will you please turn out for me?" Others, "Turn out," while still others seem to say, "Get out." I favor a musical, deep-toned horn and I am sure that a much larger proportion of the public will heed it willingly and promptly than they would the rude demands of some other kinds of signals. Many of us use our horns too much. We could get the same results with greater satisfaction to all concerned, by a little more thought and a little less rapid driving. We should follow the example of the careful expert who uses his horn sparingly. Much tooting is the prerogative of the beginner or the fussy driver.

Have you ever seen a two-ton touring car with six or seven passengers driven by a big muscular chauffeur, bearing down a decrepit old man or woman or a frightened child, tooting his horn like a fiend? What do you think of it?

Some of us also use the muffler cut-out too frequently. It has of course, a legitimate use, but it should be employed only rarely. Many drivers will open the cut-out in preference to opening the throttle, not fully appreciating the fact that it is a device that produces a highly objectionable sound. We should all realize that the cut-out, so used, is a nuisance. In some instances the driver probably thinks it is an evidence of smart driving to cause his car to gain rapid headway by opening the muffler. It is much cleverer to attain the same result by an almost imperceptible touch of the throttle lever or accelerator, unless indeed the car begins to slow up on a hill and the driver wishes to avoid changing gears.

The responsibility of helping to remove the prejudice against automobilists and of doing something definite to render the highways of the country safe and comfortable to all users, is a personal one and should be so considered by each of us.

The application of the Golden Rule in motordom will produce golden results.

PAINTING AND FINISHING THE AUTOMOBILE

By M. C. HILLICK

APART from the propelling mechanism of the automobile and the lines upon which it is built, no feature connected with its appointments contributes more directly to the comfort, pride and happiness of its user than the painting and finishing of the vehicle. While good painting and finishing do not rectify mechanical defects, nor in the least way conceal them, they do relieve angularity of lines and design and very often confer upon an unfortunate sample of designing a distinction to which, apart from the selection of color and the luxury of finish applied, is quite undeserving.

In other words, the painting and finishing of the automobile to-day has resolved itself into one of the most essential and important features of the work involved in the manufacturing and marketing of the horseless carriage and in maintaining its appearance in active service.

In painting and finishing the automobile, there are at least three highly important—well-nigh indispensable—factors to be considered. First, durability; second, choice and distribution of color upon the surface; third, quality of finish.

It is important, admittedly, that the structure of paint and varnish, built up with such an infinite capacity for taking pains, should prove durable. Even the man with wealth to "tear down his barns and build greater," is looking for the paint and varnish for his automobile that will stand out with tenacity in the face of the most rigorous service.

In the matter of appearance, color brilliancy and disposition of color upon the surface with reference to developing all its possible charms, are advantages which even the most calloused user of the automobile will be quick to admit. An individual pride has developed along the line of creature comforts and satisfaction, as a part of automobile experience, that is creating an increased demand for all that is finest and best in color, harmony and contrast.

Apparently, it is a case in the most part, of the owner trying to outdo his neighbor in getting all the color possibilities which the painter is capable of showing and the late New York shows are in evidence to prove that the painter is developing some wonderful color effects.

Without the right quality of finish, however, all these things —quality, color magnificence and striping combinations—must prove only transitory and of small moment. With this clear knowledge of the fact, automobile buyers are daily becoming more critical, more exacting and more insistent in their conclusions as to the character of the finish belonging to the surface of the car.

No more delicate or sensitive medium is employed in connection with the construction and completion of the automobile than the varnish—the protector and beautifier of all the materials entering into what may be termed, the paint structure. That this material should be of rare quality, of a worth beyond the mere measure of dollars and cents, goes without saying. Hence it is not a question of price, but one of quality that must be taken into account in making a final estimate of the elements entering into and making up the finished product, to-day accepted as an example of the painter's art.

Of systems employed in painting and finishing the automobile there are many, although in the opinion of experts, the chief varieties may be counted upon the fingers of one hand. In point of service, as in degree of importance, the oil and lead system, with modifications making it conformable to latter day requirements, is decisively a leader. Since the ancient days, linseed oil in its absolute purity has been considered to be the life of paint, no less than it is the life of varnish. White lead, the pigment with which it serves to furnish a combination of unsurpassed merit in developing a surface upon which to lay the fields of color, is in itself a pigment in density of atoms, in fineness of body and capacity for laying close and firm and surfacing to a satiny finish, that is without a rival.

However, in response to a demand for a surfacing medium quicker in its action, harder and if anything, more economical in its surfacing qualities, there has come into the markets and into large use, patent surfacers worthy of confidence and strictly eligible in every way.

The reader may be assured therefore, that no hard and fast rule exists to govern either the car owner or the painter in making a choice of systems with which to build up the pigment structures. The main thing is to employ materials that are above suspicion and qualified to furnish a service of wear and good looks, satisfactory to all parties concerned.

The automobile with a wood body, for first class work will receive as a rule, at least fourteen coats of material to carry it through to a finish. For a finish of lesser quality, there is a system of correspondingly fewer operations, graduating down to as few as half a dozen coats, for what might be regarded as a "cheap" finish.

There is, of course, a certain class of car and a certain type of man, each of which demands cheapness, and the system referred to is designed to meet such a demand.

Of the metal bodies, aluminum, sheet steel, etc., the painter is having his full share and while the paint structure over such surface is built up from fewer coats than required upon wood, such painting must be most carefully adjusted and balanced out to a nicety and made to fit the negative surface upon which it is applied. There is a lack of receptiveness in metal, either aluminum or steel and a lack of the porous qualities of wood, both of which conditions the painter must study to counteract by special methods of mixing and application in order to realize satisfactory results in his work.

The art of painting and finishing, is one demanding the utmost attention to detail as well as general basic principle. Imperfect work in this respect has a distinct negative effect.

AUTOMOBILING AND BICYCLING COMPARED

That persistent question of whether the automobile industry will be forced to cut down its production like the bicycle makers receives a new and sensible treatment in an editorial in the March issue of *Machinery*.

"A good many manufacturers of machine tools and supplies who are selling from fifty per cent to one hundred per cent of their product to the automobile trade are asking themselves how long the demand will continue, and if it will drop off as suddenly as the bicycle trade did. We think not.

"Bicycle riding was a craze that went through a family like the measles. There were five members of the writer's family and we had five wheels. That was ten years ago, and since then a new generation of children has grown up, but they don't ride wheels. The industry is now reduced to a commercial basis, and not one rider in a hundred uses his wheel for pleasure.

"Bicycling as a fad began to expire when it became commercialized, and all sorts of people took to wheeling. The future of the automobile industry, as we all agree, lies in the adaptation or development of cars to commercial uses—not accomplished yet because manufacturers so far have been unable to supply the demand for pleasure cars, and also doubtless because of the smaller margin of profit between a luxury and a strictly commercial proposition.

"After the existing and projected automobile works are equipped, we shall have some let-up in the demand for machine tools for that purpose, but the skill of our mechanics probably will develop the automobile industry gradually and conservatively until it becomes as safe and permanent as any other."

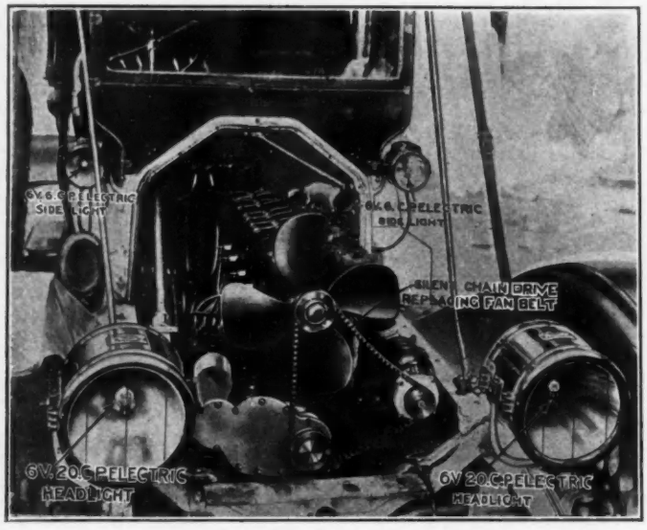

6V. 6 C.P. ELECTRIC SIDE LIGHT
6V. 6 C.P. ELECTRIC SIDE LIGHT
SILENT CHAIN DRIVE REPLACING FAN BELT
6V. 20 C.P. ELECTRIC HEADLIGHT
6V. 20 C.P. ELECTRIC HEADLIGHT

Fig. 1—Dynamo and fan driven by a silent chain taking power from a pinion which extends out on the half-time gear shaft

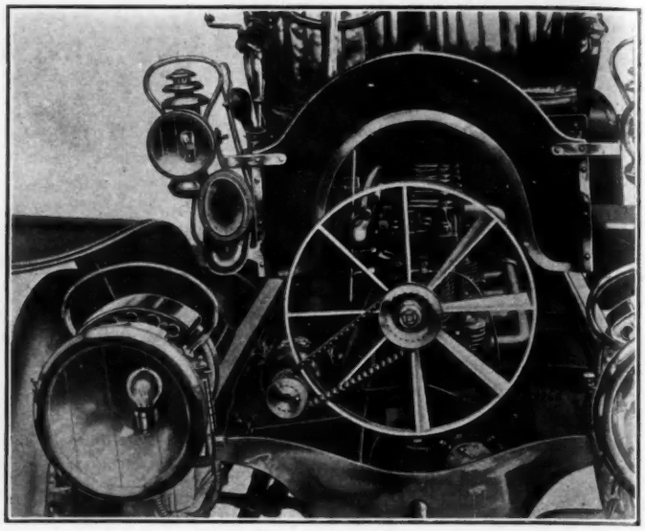


Fig. 2—Lighting dynamo driven by a silent chain taking power from a pinion which is fixed upon the fan spindle

APPLICATION OF THE APPLE ELECTRIC LIGHTING SYSTEM

TUNGSTEN lamps in view of their high watt efficiency, are the means at hand which overcome the formidable difficulties involved in the process of utilizing electric lighting in automobile work. Despite the high economy of the tungsten lamps, it is considered distinctly advantageous to float the battery on an electrical circuit which takes its energy from a charging dynamo. The dynamo is driven by the automobile motor, and is so designed and installed that the variable speed, which is essentially a feature in conjunction with the motor which drives the automobile, is compensated for with a view to delivering a substantially constant voltage of the dynamo, thus rendering it potent, either for charging the battery, or for furnishing the electric energy to the lamps direct, utilizing the battery however, as a form of stability inducer.

In the Apple system, as it is being employed at the present time, a new form of load regulator offers certain specific advantages, which is tersely described by the Apple Electric Company as follows: "As soon as the dynamo generates sufficient voltage, an automatic cut-out connects the dynamo circuit through the voltammeter to a large capacity storage battery which acts as a reservoir to accumulate the surplus current, and it supplies automatically the current for either the ignition or lighting." This arrangement permits of utilizing the energy from the battery when the dynamo is shut down.

The various methods of driving the lighting dynamo are extremely interesting, and the illustrations here afforded offer four methods in vogue, in which Fig. 1 shows the dynamo resting on an arm of the motor, and the driving chain of the silent type, meshes with a driving pinion, which is on a stub spindle, projecting out from the half-time gearcase.

In Fig. 2 it is shown that the dynamo is driven from a chain pinion which is fastened onto the fan spindle. The fan in this case takes its power from a separate source.

Fig. 3 shows the lighting dynamo driven by a silent chain, which engages a chain pinion fastened onto the shaft, which is placed to drive the magneto.

Fig. 4 shows another and very excellent variation. The lighting dynamo is driven by a silent chain, and the driving chain pinion is on the crankshaft extension which leads out to the starting crank.

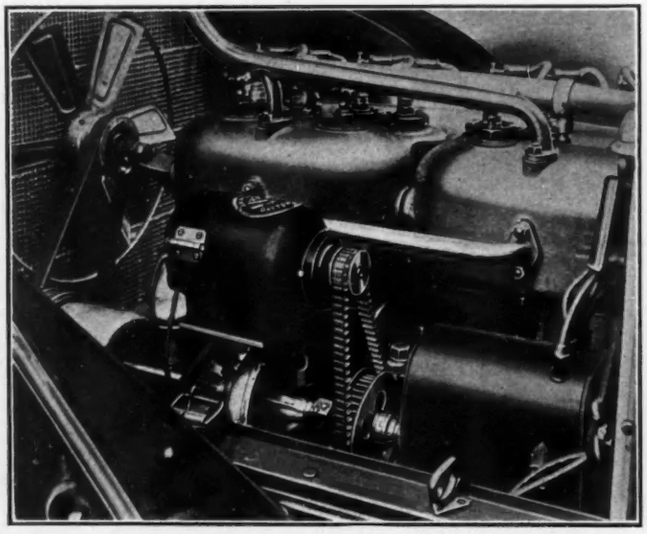
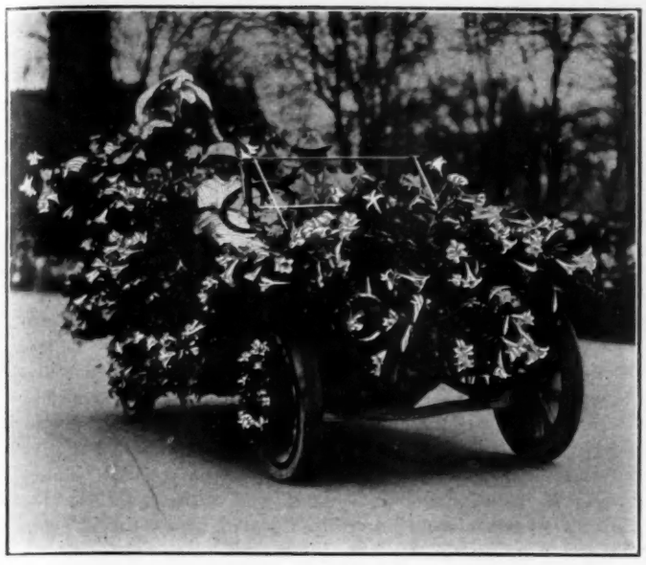
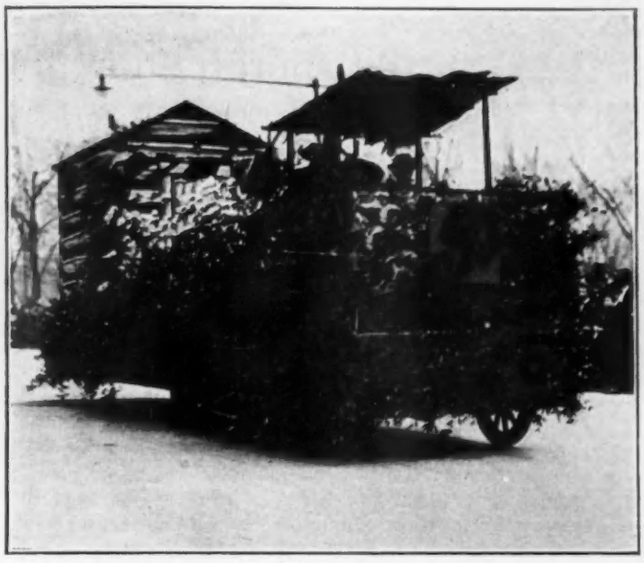


Fig. 3—Lighting dynamo driven by a silent chain taking power from a pinion which is fastened to the shaft which drives the magneto

Fig. 4—Lighting dynamo driven by a silent chain which in turn engages a pinion taking power from the crankshaft direct



First Prize Car, a Chalmers Entered by Louis G. Deschler



One Premier Entry as It Appeared in the Floral Parade

HOOSIER OPENING WEEK EXCELS ITS RECORD

INDIANAPOLIS, Apr. 2—Surpassing its former efforts in the line of making its annual motor car opening week an event of importance, the Indianapolis Automobile Trade Association eclipsed its record this week. The floral parade which took place last Wednesday was one of the most striking features of the opening and the artistically decorated cars showed to great advantage.

The Packard truck and the Premier exhibits were unusual in their finery. The truck was arranged like a white battleship, armed with American Beauty roses and carrying a full brass band. The Premier car was the groundwork of a plantation scene. The Hupmobile represented a locomotive.

Each year it has been the custom for local members of the motor car trade to set aside a week for a formal opening, each concern exhibiting in its own salesroom or factory, but participating in various public events. These individual exhibitions are necessary by reason of the fact that there is no building large enough to accommodate such a combined exhibition as there would be, if all should decide to show together.

The extent of the local industry may be seen readily from the fact that more than 90 concerns are identified with the trade. There are 45 agencies representing 80 different makes of cars. There are also an even dozen factories for the manufacture of cars, and numerous concerns for the manufacture of parts and accessories, besides branch tire houses, etc.

Each year the practice of awaiting opening week before purchasing is growing in popularity and as a result the public interest in the event this year was greater than ever before. It has been estimated that 200 cars were sold.

Monday and Tuesday were devoted exclusively to the display of cars in the respective salesrooms and factories.

There were a number of gymkhana contests at the Indianapolis Motor Speedway Thursday afternoon, the speedway management having donated the grounds and no admission fee was charged. Contests were limited to stock gasoline cars with full catalog equipment. The event was in six sections.

Another event of considerable interest and importance was the review, or parade of 1910 models.

The opening concluded Saturday evening with a banquet at the Denison Hotel.

Packard, Prize Winner, Entered by Willies Holcomb Company

L. G. Deschler's Rapid Delivery Wagon in the Flower Event

Pittsburgh Show Proves An Eye-Opener

PITTSBURGH, Mar. 26—The fourth annual Pittsburgh automobile show opened in the spacious Duquesne Garden to-night. More than 4,500 persons viewed the $1,000,000 display. It was in sharp contrast to the scattering exhibitors who "made" the first show four years ago.

Instead of a "baker's dozen" cars on exhibit there were actually 125 models shown on the floor of Duquesne Garden, varying in cost from $450 to $7,000 and in size from the 10-horsepower runabout to the magnificent 70-horsepower touring car. Where four years ago there was not a truck shown, to-night the enterprising merchant and manufacturer had the pleasure of viewing 11 different types of commercial delivery wagons, which are fast revolutionizing the transportation methods in this hilly city. Fifty firms were on the floor with splendid exhibits of accessories, where at the first show hardly a booth was devoted to this purpose. Progress in automobiledom was evident.

Quite as striking was the wonderful advancement made in the show settings. This year the committee, composed of F. D. Saupp, chairman, G. P. Moore, James R. Newell and W. N. Murray, was diligent to make the 1910 exhibit far ahead of any other automobile show ever held in the Keystone State. Profiting by past experience they first arranged for the making over of certain parts of Duquesne Garden so as to afford more space for exhibits. As a result 40 more booths were provided than last year and even with this number nearly 60 prospective exhibitors were refused space this week. Money and pains without stint were spent on the decorations of the big Garden. Thousands of yards of gold, canary and white draperies and hundreds of bay trees and palms and monster hanging baskets of flowers gave the place a splendid Eastern appearance. High above the multitude that promenaded between the lines of costly machines hung the famous Curtiss aeroplane. In front of every exhibit hung an art glass, bronze electric light dome, suspended by massive wrought-iron chains and having emblazoned on it the name of the exhibitor.

The 1910 committee has acquitted itself most creditably in another particular. This show has been advertised. Instead of a few scattering meager notices which were easily overlooked by readers of daily papers, a campaign of publicity has been successfully waged for a month. News features were devised which made advance notices attractive reading. Every paper in Western Pennsylvania was asked to help along in the work of bringing to the notice of the general public the tremendous growth of automobile sentiment west of the Alleghanies. As a direct result many exhibitors from the big and wealthy country towns applied for space. Dozens of dealers from these places were present the opening night and assurances received from them show that during the coming week thousands of half dollars will be turned into the show till, by automobile owners and prospective buyers who are eager to grasp this chance to inspect at a small outlay of time and money the great variety of 1911 models shown, for the majority of the cars on exhibit are next year's types.

The Standard Automobile Company had on exhibit a car, the usual brass parts of which were gold plated, giving the visitor a glimpse of dazzling automobile beauty. Racing cars were frequent in the exhibit and the latest wonders of mechanism stood alongside battle-scarred veterans which boasted of many a hard victory on the race track.

Away above all other features in the way of comparison is the exhibit of trucks at this show. The motor truck until last year never found a place at Duquesne Garden. The 1909 show boasted of two or three exhibits, which were well received, but were not strong enough to force any large measure of attention from the crowds. This year it is different. A variety of trucks is shown which rivals the exhibit of cars although the number is of course smaller. The entire front of the big hall is taken up with these exhibits, which include 11 different models.

The largest exhibit is that of the H. Lange Wagon Company, of Pittsburgh, which has the following trucks, all the property of well-known firms of Greater Pittsburgh, on show: Thirty-five-horsepower two-ton truck, $2,750, used by E. M. Diebold Lumber Company; 60-horsepower four-ton truck, $4,500, used by W. A. Hoeveler Storage Company; 45-horsepower four-ton truck, $4,500, used by Ohio & Pittsburgh Milk Company; 50-horsepower three-ton truck, $3,700, used by Edward E. Rieck Company; 35-horsepower 1,500-pound truck, $2,200, used by Edward E. Rieck Company; 30-horsepower one-ton truck, $2,100, used by Charles

Montreal Coliseum during the Recent Show, with Four Prominent American Makes Represented in the Foreground

P. Mungle & Sons; 30-horsepower, one-ton truck, $2,200, used by Wenzel, the caterer, of Braddock.

On the other side of the front entrance the Standard Auto Company shows the big Packard truck now in use by the wholesale firm of Arbuckle & Company. It is a 24-horsepower three-ton truck with a bed especially built for the Arbuckles by A. McClinton, of Pittsburgh. The Packards put their first truck into use in Pittsburgh last March. Now they have 11 in use here and are building four more to contract.

Adjoining the Packard display are two types of the White truck, the agency for which has just been established here. They are a $3,000, ton and a half, gasoline truck, which may be fitted with a wide range of styles of body and their three-ton gasoline truck with standard platfrom body, selling for $3,850. At the other end of the hall near the orchestra, the Overland 25-horsepower truck, seating two and selling for $1,100, is shown by the Keystone Automobile Company, of Pittsburgh.

Increasing interest in automobile matters is shown not only in the attendance at the show but also in the number of agencies which have been placed within the past week and most of which were making their initial bow to the Pittsburgh public to-night. Some of the most important of these are the following: Reliance truck, which will be handled by a new company composed of H. C. McMasters and P. K. Soffel, of the Wabash-Pittsburgh Terminal Railroad Company, and others; the Overland truck, with the Keystone Automobile Company; the White Company's truck agency; the new Whiting-Pittsburgh agency; the Abbott-Detroit, which will be handled by the Forbes Motor Car Company; the Sebring-Pittsburgh agency; the Krit car, to be sold by the Forbes Motor Car Company, and the Hygay electric outfit.

Following is the list of cars exhibited:

Abbott-Detroit, Atlas, Autocar, Baker Electric, Brush, Buick, Chalmers, Columbia, Corbin, Courier, Croxton-Keeton, Elmore, E-M-F, Flanders, Ford, Franklin, Hudson, Hupmobile, Enger, Inter-State, Jackson, Kline, Knox, Krit, Locomobile, Marmon, Maxwell, Mitchell, National, Otto, Overland, Parry, Paterson, Packard, Peerless, Pierce-Arrow, Pittsburgh Six, Pope-Hartford, Premier, Pullman, Rambler, Rauch & Lang Electric, Regal, Reo, Sebring Six, Speedwell, Stearns, Stevens-Duryea, Studebaker, Studebaker Electric, Thomas Flyer, Waverley Electric, White, White Steamer, Whiting, Winton and Woods Electric.

List of accessory exhibitors: Ætna Insurance Company, Airtight Steel Tank Company, Atlantic Refining Company, Automobile Accessories Company, Banker Wind Shield Company, Brictson Manufacturing Company, Buick Motor Company, Pittsburgh Branch; Cleveland Chain and Manufacturing Company, Doubleday-Hill Electric Company, Ernst Flentje, Gasoline Motor Efficiency Company, James L. Gibney & Brother, L. Giesenkamp, Sons & Company, Hydraulic Oil Storage Company, Greater Pittsburg Auto School, Kent-Bell Company, Kerr-Griffin Vulcanizing Company, Kilgore Manufacturing Company, Motor, Miller Rubber Company, Mutual Manufacturing Company, Petroleum Products Company, Pittsburgh Auto Tire and Equipment Company, Pittsburgh Rubber Company, Reinforced Brazing and Machine Company, Rogers Printz & Company, J. A. Salman, Standard Auto Company, Star Rubber Company, E. J. Thompson Company, Westinghouse Electric and Manufacturing Company, Joseph Woodwell Company, Wright Wrench Company and N. H. Wishart.

List of truck exhibitors: H. Lange Wagon Company, Standard Auto Company (Packard truck), White Company (Pittsburg agency), and the Keystone Automobile Company (Overland truck).

Canadian National Show Held in Montreal

MONTREAL, Apr. 2—The Automobile and Boat Show of the Automobile Club of Canada closed to-night after a week during which former attendance records received a severe shock. No attempt has been made to give the Coliseum the appearance of an apple orchard or rose garden; the decorations were simple and businesslike. Draped bunting concealed the roof beams and was festooned along the sides of the hall, and three rows of signs of the severest uniformity traversed its length.

The exhibits were more international in character than usually seen. Of course American makers were in the majority, both those imported from across the line and those made in Canadian factories to escape the duty. Among the latter the McLaughlin-Buick and the Canadian Regal were prominent. Packard, Knox, Franklin, Maxwell, Oldsmobile, Simplex, National and Hupmobile all were extensively represented by their agents.

The native Canadian industry was represented by the Russell and the Comet, both cars of creditable workmanship, and following European lines to a considerable extent in their design. Charron and Renault represented the French industry, and several English makers turned out to seek the colonial trade. Along the sides of the hall, where the accessory dealers exhibited their wares, one might have thought himself in the New York or Chicago shows, so completely had the American makers monopolized the spaces. The show is regarded as a complete success from the financial and commercial points of view, and the show committee and E. M. Wilcox, the energetic manager, are receiving many congratulations.

Another View of the Montreal Show; Renault, Packard, the Canadian Buick, and Russell, a Home Product, Appear

SHARP FIGHT ON AUTOMOBILE CLUB OF FRANCE

By W. F. BRADLEY

PARIS, Mar. 28—After having had undisputed control of the automobile industry of France and also possessing a powerful influence over the national clubs of Europe, the Automobile Club of France has now to fight for its existence. For eleven consecutive years it has organized the brilliant exhibitions in the Grand Palais, looked upon by other nations with respectful awe; it has had complete control of the racing situation, has decided under what conditions races should be held, and merely by its decree has brought all racing to a stop throughout Europe. In France it was impossible for any move to be made or any scheme of importance to be put on foot without the approval of the Automobile Club.

Now its authority is being disputed everywhere, and curiously, the manufacturers who formed its committees and are still among its members, are the most active in fighting the oldest established automobile organization in the world. After a very severe fight the club has had to abandon the annual show held in the Grand Palais to a joint committee of manufacturers. The club announced an exhibition as usual, but the makers banded themselves together and refused to take part in any exhibition other than one held entirely under their own management. After a long fight the club has to agree to withdraw with the meagre satisfaction of patronizing the makers' show and appointing the honorary president. It will have nothing to do with the management and will have no share whatever in the profits of the undertaking.

The Automobile Club of France is now being attacked by the aeronautical manufacturers, who accuse it of a policy of grabbing after aeronautical control. In a letter just sent by Robert Esnault-Pelterie, president of the Aeronautical Manufacturers' Association, an ultimatum is presented to the club to cease to occupy itself in any way whatever with aerial navigation. In very vigorous language Esnault-Pelterie declares that the Automobile Club of France added an aero section to its Salon in 1908 merely to get control of the field, that in 1909 it did its best to oust the aeronautical manufacturers, and that this year it has just been baffled in an attempt to run an aeronautical show.

Before the Automobile Club was defeated in its recent fight with the manufacturers, the latter had entered into an agreement with the aeronautical men to join them in a joint aero-automobile show in the Grand Palais, as a rival to the one promised by the club. The club having withdrawn its show, and given its patronage to the constructors' exhibition, these latter asked to be freed from their contract with the aero men. Esnault-Pelterie replied that he was quite willing to set them free from their contract, but only on condition that the Automobile Club of France should cease to have any further connection with the aeronautical industry. "You are an automobile club; stick to your automobiles," he declares, "and leave us, who know something about flying machines, for we risked our lives in them while you sneered at us, to develop aerial navigation according to our own views."

An immediate reply has been asked for, but up to the present the club has not taken any official notice of the letter.

AERO ACTIVITIES INCREASING IN GERMANY

BERLIN, March 28—In response to a general demand, the German Wright Company has begun to fit wheels to its aeroplanes, as it is far easier for a novice to learn on an apparatus with wheels than without. The principal drawback of the earlier method was the necessity of taking the first flights with an instructor, and as the number of experienced teachers is very small compared with that of the pupils, many of the latter were forced to wait an undue time for their turns.

German aeronautics have suffered a great loss in the death of Lieutenant-Colonel Moedebeck, who on retiring from the army nearly fifteen years ago started the first aeronautic magazine in Germany, which he edited to the time of his death. He was the writer of various valuable handbooks and treatises, and it is largely due to his unflagging activity that aeronautics of all kinds have spread so generally throughout Germany. Colonel Moedebeck was a member of several international commissions.

Two resolutions have been unanimously accepted in the German parliament concerning the erection of an Imperial Institute for Aeronautics and Aero Technic at Friedrichshafen. Although this city is the scene of the Zeppelin activities, the institute will naturally be open to all makes and types of aeronautic apparatus. An imperial commission is to be called by the Government to debate on ways and means. Count Zeppelin has declined the presidency owing to pressure of business.

FARMAN PUPILS OUTSTRIP THEIR MASTER

RHEIMS, FRANCE, Mar. 28—Van den Born, formerly racing cyclist, later aviation pupil, now instructor at the Farman school, has surprised his master by making a cross-country flight from Mourmelon to Rheims and return, a total distance of nearly 40 miles. The outward trip passed without incident, and when the suburbs of the champagne city were reached the military quarters were selected as the most suitable place for a descent. After lunch the return journey was commenced, but it was not long before the pilot discovered he had hopelessly lost his bearings. A landing had to be made near a village which proved to bear the name of Prosnes; villagers assisted in the unusual task of starting the Gnome motor, and with directions as to his route a safe return was made to the aviation ground.

Georges Chavez, another Farman pupil, with only six lessons to his credit, has succeeded in creating a record of 1,670 feet in height over the Mourmelon aerodrome. The height was recorded by a registering barometer. Chavez, who is a young athlete of Peruvian origin, declares that he will go after the records for altitude now held by Paulhan and Latham. He has already made a cross-country flight of 1 hour 47 minutes in duration.

ROUGIER'S FLIGHTS STARTLE RIVIERA

MONACO, Mar. 28—Henri Rougier, one of the most brilliant of automobile race drivers of the Gordon Bennett and Grand Prix period has startled the Riviera by flights over the Mediterranean and the mountainous coast of Monaco, Monte Carlo and district. A year ago valuable prizes were offered to the aviators who would fly across Monaco Bay and return, a distance of less than five miles. Although about 30 entries were received not a single machine ventured forth, owing to the exceptional difficulty of making a start and coming back to earth. Monaco nestles on the edge of the Mediterranean at the base of a cliff rising almost vertically to a height of 3,000 feet; Monte Carlo adjoining it, rises tier upon tier on a picturesque mountain side. In the whole district there is not an acre of level ground, and the only level street is the *quai* about 300 yards in length, with the castle promontory rising up perpendicularly on one side and a well filled harbor on the other. It is necessary to make a start on this, with the certainty that if the machine runs to the left it will drop into the harbor, if it deviates to the right it will smash itself to pieces against the granite walls of the castle, and if it does not rise rapidly it will collide with the sea wall forming a barrier across the end of the jetty.

Rougier believed that with his Voisin biplane and Gnome motor he could rise from this ledge and fly over this mountainous coast. He proved it. His machine was brought from Heliopolis, where strong winds had made flights over the desert a difficult matter. It was erected, the motor tested, and there being no place available for a trial flight, sent away for a trip across the sea. After a run of less than 200 yards the machine was in the air, had cleared the sea wall 30 feet high with a safe margin, and was directly over the Mediterannean at a height of 300 feet. In a few minutes he had reached Cape Martin, on the opposite side of the bay, rounded it, returned and flown over the town of Monte Carlo, steered out to sea, described a curve in order to get in line with the jetty, and descended on the ledge at the door of his shed with remarkable ease. On the two following days a strong wind prevailed, making flights impossible. During this interval, and while testing the motor, the mechanic lost the tips of two fingers, chopped off by the whirling blades of the propeller. On three successive days flights were made across the bay under practically the same conditions as on the first occasion.

Then Rougier prepared for a more sensational exploit. He got away from the *quai* side, flew over the bay in an easterly direction and began describing wide circles until he had attained a height of almost 3000 feet. He was then but a speck against the bold outline of the mountain range and from below appeared to be almost level with the top of Mount Agel, 4,000 feet above sea. Following the range of hills dominating the bay he continued eastward, passing over the Turbie, up which he had many a time raced in hill-climbing competitions, then reached the French fort on the top of the Tête de Chien, a mass of rock rising almost vertically from the sea to a height of 2000 feet. By the aid of field glasses it was possible to see the soldiers standing on the fort waving their hats to the aeronaut passing over their heads. By reason of the wild nature of the country it is a matter of two hours to travel by automobile from Monaco to the fort, only 2,000 feet away; by horses the journey occupying four or five hours. Rougier, on his Voisin biplane, flew over the fort within twenty minutes.

The descent was a matter of a few minutes, the aeroplane sweeping down over the town, passing out to sea again, flying over the Prince of Monaco's palace as it did so, then coming inwards in a line with the jetty. On the next occasion a trip was made along the coast in the direction of Italy, the aeroplane flying over the sea until the port of Mentone was reached. This was rounded, the return trip commenced and when near Monte Carlo the aeroplane swept to the right to pass directly over the casino and gardens. While in this position the motor was stopped for a few seconds, to the consternation of the spectators, who believed that a serious accident had happened. But the current was switched on again before the aeroplane had dropped far, and five minutes later Rougier had landed with the remark that he had just been taking a little trip for the sake of his health. These flights are regarded as the more remarkable for the reason that the Voisin biplane has neither *ailerons* or plane-warping to secure stability, and has always been considered a fair-weather machine.

LENGTHENS LIFE OF OLD TIRE COVERS

PARIS, Mar. 28.—Since the day when the Davies Brothers put the Stepney emergency wheel on the English market there have been numerous copyists in various parts of the world. Most of these have merely sought to produce a spokeless wheel which, as in the case of the Stepney, would allow the car to be run home without work on the tires, after a puncture. The Houdaille, just produced by a French firm, claims to have a wider field of usefulness, for as it is secured to the outside of the rim, and not hooked to the inside, it can be attached whether an inflated or a deflated tire is in position. This allows it to be used temporarily where a non-skid is required on a car, the four wheels of which are shod with smooth tires.

It allows of twin tires for the rear, when a temporary, heavy load, has to be carried, and it further allows old covers to be used up in pairs for town work, which would certainly burst if run singly over country roads. The makers attach considerable importance to the device as a commercial accessory, for on delivery vans it frequently happens that a car has to be overloaded in a manner that is apt to be injurious to its tires. If the Houdaille wheel is added with the extra load, the weight is carried better and the covers do not suffer.

As in all other devices of this nature, the Houdaille consists of a steel rim, without spokes, on which a fully inflated tire is mounted ready for use in case of emergency. Its individuality lies in the method of attachment. There are no permanent lugs to the rim, with jaws for clamping to the road wheel, but in its place a steel tube triangle, at each angle of which is a forged steel wedge of special shape. Two of the wedges are pivoted to the angle of the triangle, while the third is secured by a strong bolt screwing through the body of the frame, and entering into the wedge.

The shape adopted for the wedges is such that one half presses against the inner face of the movable rim, and the opposite half against the corresponding portion of the fixed steel rim.

It is shaped in such a way that it enters between the spokes of the wheel and surrounds the wooden felloe. When in position and screwed up by means of an ordinary spanner, pressure is applied to the two rims at three different points on their circumference. A couple of studs project from the face of the spokeless rim and thus act as an additional guard against the wedges slipping.

In reality the rim becomes a wheel with three spokes, and is almost as solid in construction as one of the car wheels. When once the pressure has been applied it is impossible for the wheel to slip unless the pressure is relaxed, and this is prevented by a suitably shaped plate fitting over the head of the bolt, secured there by two springs, and further held by a thumbscrew. When not in use, the spare wheel can be attached to a special triangular carrier designed for that purpose and secured to the side of the car, or the triangular attachment may be dismounted, and the whole carried in the same way as a dismountable rim.

New Idea in Carbon Removal

Editor THE AUTOMOBILE:

[2,214]—In the February issue of "Motor," under the title of "An Original Carbon Remover," appears an article by A. D. Hard, in which he advises the placing of a small steel ball, about 3/16 inch in diameter, in the cylinder above the piston. He claimed that the bombarding action of this ball would serve continuously and effectively to keep the combustion chamber, the end of the piston, and the exposed surface of the valves completely free from carbon deposits without any further attention. This appeals to me a very simple remedy for the carbon trouble, if no damaging results could come of the loose ball in the combustion chamber. I am the owner of a Maxwell Model E touring car, and would like to give this method a try, if in so doing I would run no risk of damaging the engine. Would you kindly advise me through the columns of "Letters Interesting Answered and Discussed" of your paper? A. R. L.

Bay City, Texas.

Best of all ways to solve this is the method of trying it. There is something in what the writer says about the action of the gases and the position of the ball at the time of valve opening which tend to keep the ball in. The only danger you would be exposed to would be the destruction of your valves through the ball getting to the seats and sticking there. It may be that this cannot happen, as the writer of the article in question says. On the other hand, this would be noisy in a multi-cylinder engine.

Proper and Improper Tire Pressures

Editor THE AUTOMOBILE:

[2,215]—Since January 1st, when I became a subscriber to "The Automobile," you have several times spoken of the advisability of keeping tires pumped up hard, that is, to a uniform and proper pressure, but I have never seen an article which gave the specific tire pressures for different tires, under maximum loads. My car is a Ford Model T, with tires 30 by 3 on front wheels and 30 by 3½ on the rear. The maximum load carried on the tires is about 2,050 pounds. Please let me know through your column of "Letters Interesting Answered and Discussed" the proper pressure for these tires; also, if an extra weight of 150 pounds could be carried without overloading tires as small as these. CHAS. B. FOSTER.

Water Mill, N. Y.

Tables of tire pressures have frequently been published, but the pressure and carrying capacity of this sized tire will be given again. Thus, one maker recommends for 30 by 3 tire 65 pounds pressure and give it 350 pounds carrying capacity. For 3 1-2-inch tires the pressure figure is raised to 80 pounds, while the carrying capacity rises to 450 pounds. This would make the whole carrying capacity of your four tires amount to two times 350 plus two times 450 or 700 plus 900, a total of 1,600, which would then allow you much more than 150 pounds overload.

Wants Address of Runabout Maker

Editor THE AUTOMOBILE:

[2,216]—Will you please inform me through "Letters Interesting Answered and Discussed" where I can secure a complete description of the "Billy Four," or give me the address of the maker or of some agency from which I could get the information?

Lyons, O. F. H. CARPENTER.

The "Billy Four" is made in Atlanta, Ga., and is sold by the American Sales Company, of the same city. You will find a description of it, in tabular form, in the tables of specifications in THE AUTOMOBILE issue of February 3.

Getting Into the Automobile Business

Editor THE AUTOMOBILE:

[2,217]—Will you kindly give me some advice through "Letters Interesting Answered and Discussed"? I have made a careful study of the automobile and am familiar with every bolt or piece of mechanism in one. I am eighteen years old and have a good education; have had some experience at driving and some at repairing and am prepared to do anything of the kind. What would you advise me to do in order to obtain a permanent foothold in the automobile world? READER.

Hudson, Mich.

The automobile industry is large enough for a man to make a success in it in a number of different ways, each requiring talents of a different sort. What you should do to gain a foothold naturally depends on which of these lines you wish to enter. Do you wish to be a designer, a factory manager or superintendent, or a salesman?

For the automobile designer a college education, leading to a degree of M. E., may be regarded as essential. Although automobile design in the past has been largely a matter of rule of thumb, it is rapidly becoming more scientific, and the man who wishes to make a success at it should have the best possible engineering training. Another way of beginning, which would more naturally lead to the position of factory superintendent, would be to start at the bottom as an apprentice or helper in some automobile factory.

The natural way to become a salesman is to sell cars, by securing a position in that capacity with an agency or selling branch. Starting with a position in a small agency, a man of the requisite ability would soon rise to positions in larger cities, in branches controlled directly by the manufacturing company, and from there would graduate into the organization of the company itself.

Presidents of companies come both from the manufacturing and from the selling ends of the business. Sooner or later, the man who possesses the executive ability to handle a large business will get an opportunity to show it, and recognition will follow, whether he be a designer, or a salesman. If he should have the training of both, so much the better.

Formula for Heat-Resisting Paint

Editor THE AUTOMOBILE:

[2,218]—Will you kindly give me through "The Automobile" a formula for a fireproof paint that will resist the heat on the exhaust manifold of my engine? H. L. LANG.

Staunton, Va.

Although there are many formulas which could be used for the purpose, all require a disproportionate outlay for the ingredients, besides the trouble of mixing. The most satisfactory paint for such purposes, all things considered, is ordinary stove polish, such as can be purchased at any hardware store, or can probably be found in your kitchen closet. If the exhaust manifold is badly rusted, the rust should be cleaned off with a stiff-wire brush, or by scraping with the back of an old knife. The polish will also be found to improve the appearance of the whole cylinder castings.

Relation of Power to Speed

Editor THE AUTOMOBILE:

[2,219]—To settle a dispute, will you please state, in "Letters Interesting Answered and Discussed," if an ordinary gasoline motor develops its maximum power at its maximum number of r.p.m., or when running at a lesser speed. H. STEINER.

New Haven, Conn.

The exact answer to this question depends entirely upon the torque curve of the engine, and this curve varies with each and every different engine, so that it would be necessary to have a large number of them in front of one, before even an average answer could be given. Speaking very generally, the maximum power does coincide somewhat closely with maximum speed, although there are numerous instances to the contrary.

Estimated 1910 Car Production

Editor THE AUTOMOBILE:

[2,220]—Will you please tell me the six greatest manufacturers of automobiles in the United States, and the production of each per annum? What is the best automobile on the market.

Cleveland. ERNEST VOLGER.

If you have reference to quantity, approximate figures on the 1910 production of some of the largest American producers are as follows:

Ford, 20,000; Buick, 20,000; E-M-F, 18,000; Willys-Overland, 15,000; Maxwell-Briscoe, 22,000; Reo, 12,000; Cadillac, 8,000; Jackson, 6,000, and Mitchell, 6,000.

The above figures are of course approximate, for it is impossible to obtain a correct and exact estimate of the number, as the manufacturers themselves seldom know to within a hundred or so of the number of cars which they will produce.

As to the best car, that depends entirely upon the price, and even knowing the specific price you wished to pay, it would be a very hard matter to determine. Picking the best car is like selecting the best location for a house, or the best kind of a house to put on the location, when the latter is selected, or many other things in which personal prejudice may enter. In short, it is only a relative matter, what would seem best, at any one price and in any one class, would probably not suit your neighbor at all.

Remedy for Trouble with Soot.

Editor THE AUTOMOBILE:

[2,221]—In referring to the December issue of "The Automobile," page 1049, in which F. N. P. is having trouble from soot in his two middle cylinders, I wish to suggest that he is likely using a single carbureter for the four cylinders. The two middle cylinders being nearer to the carbureter than the end ones would get a higher mixture, thus causing carbon deposits. Would suggest using two carbureters. W. H. HARRIS.

Morris, N. Y.

The cure is worse than the disease, that is, there would be more trouble experienced with the adjustment and use of two carbureters than is the case at present. If the above is the true source of trouble, a better and cheaper way would be to design and have cast and machined a new inlet manifold which would not have a differing distance from the carbureter in the four cylinders. For this purpose, the loop shape is much favored, and is being slowly used more and more.

On six-cylinder engines, in particular, the matter of proper charge distribution has been investigated with great thoroughness, makers going so far as to construct and try out all possible shapes which could have a good influence. Some of these had no direct result, while others showed merit by an increase in the amount of power developed, in speed, and otherwise.

Basic Carbureter Patent

Editor THE AUTOMOBILE:

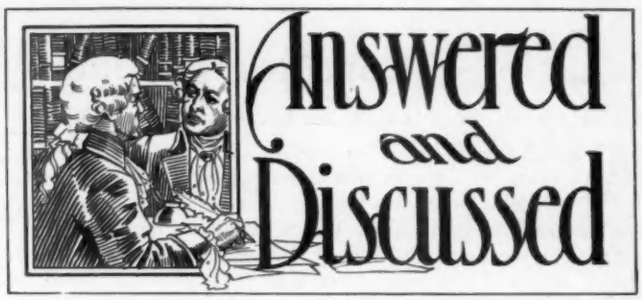
[2,222]—I would like to know if there is a patent still in force which controls in any way the using of floats in carbureters? Would also like to know the name of some firm manufacturing floats. Please answer in your Questions column. R. S. HILL.

Des Moines, Ia.

No, there is no basic patent now in force on the use of a float in a carbureter. This may be reasoned out by inference, from the fact that all carbureters have floats, while nearly all companies making them are competing with one another. Obviously this could not be the case if one held a basic patent on the use of a float.

To secure a basic patent, it is necessary for one to have either a new and decidedly different idea, or else, a new and decidedly different combination of old ideas. Since the first carbureter, that of Maybach in 1884, had a float, it was impossible for anyone to patent its use after that time.

You may obtain cork floats from the Armstrong Cork Company, Pittsburgh, Pa., while nearly any tin shop will make copper floats for you.



Flywheels and Gyroscopic Force

Editor THE AUTOMOBILE:

[2,223]—I will be greatly obliged if you will answer the following questions in "Letters Interesting and Instructive":

1. Would it be possible to run a 60-pound vanadium steel wheel 22 inches in diameter (weight concentrated at the rim as far as possible) between 4,000 and 5,000 r.p.m.? Would it be safe?

In your issue of January 20, 1910, you state that the safe rotative speed is $\frac{6{,}000}{\text{circumference of flywheel in ft.}}$ for cast-iron. My reason for writing is that I have been unable to find out the relative strengths of cast-iron and cast-vanadium steel.

2. If the above wheel is running in a vertical position how much pressure (in pounds) would have to be applied at the end of a lever 15 feet long to move it towards the horizontal plane? If there is a formula for this please state it.

New York City CHARLES E. JONES.

The strain on a flywheel rim due to centrifugal force is expressed by the formula $S = .00005427WRN^2$, in which S is the strain in pounds, W the weight of the wheel in pounds, R the mean radius of the wheel in feet and N the number of revolutions per minute. The formula you quote is derived from this by finding the strain per square inch of sectional area of a cast-iron wheel, which would be $S_1 = .000027V^2$, in which V is the velocity of the rim in feet per minute; it has been found that a tensile strength of 10,000 pounds is all that can be reasonably assumed, and taking a factor of safety of 10, $1{,}000 = .000027V^2$, whence $V^2 = 1{,}000 \div .000027$, and $V = 6{,}085$.

Taking into account the greater weight of steel, the strain per square inch of a steel wheel would be $S_1 = .000029V^2$. The determining quantity is then the tensile strength of the steel which you wish to use, divided by a reasonable factor of safety. Your 22-inch wheel turning at 5,000 revolutions would have a peripheral velocity of 28,800 feet per minute, which by the formula above would give a strain per square inch of 24,000 pounds. Whether this would be safe or not depends of course on the steel. "Vanadium steel" is a rather indefinite term, as vanadium is frequently used in combination with either chromium or nickel, or with both, resulting in considerable differences in the properties. However, you should be able to get a tensile strength of 100,000 pounds.

Your second question is not clear. A gyroscope, for as such you evidently wish to consider the flywheel, tends to keep its axis paralled to its original position; it offers no opposition to any movement which would not have the effect of changing the line of the axis. Thus, when a gyroscope is rigidly fixed in a car or boat with its axis vertical, it resists any swaying movement, but not forward or backward or up and down movement.

Editorial Note.—Many letters intended for use in these columns are received without a signature or anything to show by whom they were written. In the future, such letters will not be answered unless accompanied by the true name of the writer. If desired, this name will not be published, and a nom de plume will be used. Nor can the letters be used in the immediately following issue, for the supply on hand at all times is such as to preclude the possibility of this, unless some were used out of the order in which they were received. Obviously this would not be fair to all those concerned.

Concerning Pending Federal Legislation

By XENOPHON P. HUDDY, LL.B.

A BILL has been introduced in Congress by one of the prominent automobile organizations providing for a Federal automobile license, such as is indicated above, and this bill proceeds on the theory that interstate travel for pleasure by means of an automobile constitutes interstate commerce. Another automobile association has also introduced a Federal bill which does not include the traveler for pleasure. Since most of the interstate automobile travel is for pleasure it would be practically useless to have a Federal law if this class of travel is not taken care of. How can this be done?

Of course, if Congress is to enact legislation of this character the power to do so must be clear, since our national legislative body will not enter upon the business of passing statutes of doubtful validity. It is claimed that since interstate automobile travel for pleasure constitutes interstate commerce, the power of Congress undoubtedly exists. It is agreed that the Supreme Court of the United States has practically established the law to the effect that interstate transit or intercourse or communication comes within the constitutional provision granting to the Federal Government exclusive power over interstate commerce. It is conceded that the telegraph, the telephone, the steamboat, the railroad train and other instrumentalities of communication between the States have been held to constitute means by which interstate commerce is carried on. It has also been decided that persons walking to and from their homes and places of business morning and night over a bridge spanning a river separating two States are engaged in interstate commerce. It is obvious, however, that in all the decisions of the Supreme Court of the United States, the facts in each case had something to do with business or showed something done in pursuance of the execution of something pertaining to commercial activity. Our highest judical tribunal of the land has not gone so far as to say that a mere stroll or ramble across the boundary line of a State constitutes interstate commerce. Moreover, this never will be the law any more so than insurance is interstate commerce. This latter proposition the Supreme Court has decided. So it will be seen that to frame a Federal automobile license law on the theory that interstate touring constitutes interstate commerce is radically a wrong foundation to base such a proposed enactment on. There is another method, however, by which the same end may be gained.

It is conceded that Congress has jurisdiction over the actual interstate commerce carried on over the highways and roads leading from one State into another. That there actually exists such commerce must also be conceded. Trucking is constantly carried on over interstate highways. Stage coaches are being run. Express companies operate their vehicles. Mail wagons carry the mail. Delivery wagons from stores deliver packages. Electric trolley cars carry passengers and freight on many roads which run from one State to another.

It may be asked whether the interstate commerce which concededly is to be found on the ordinary land highways of travel running from one State to another may be protected by the United States Government. Most certainly it can be. Any interstate or foreign commerce, not only may be protected by Congress, but it may be controlled. We need not dig into the law reports to support by authority this proposition. Admitting that we have established the existence of interstate commerce on the public highways and the proposition that Congress may protect it, we will now develop our argument and ascertain further what might be done by Congress in surrounding this commerce with protection. I may add that the mere fact that interstate commerce may be found, or perhaps I would put it a little stronger, might reasonably and probably be found on any interstate way, would give Congress the power to legislate against any other traffic which might injure or affect that commerce coming in contact with it.

The fact that interstate travel for pleasure by means of the automobile does not constitute interstate commerce, prohibits Congress from directly granting a Federal privelege to an automobilist. But the fact that an automobilist runs his motor vehicle on an interstate highway where interstate commerce is actually being carried on, will not prevent Congress from enacting legislation, regulating the automobilist so that he is compelled to drive his vehicle so that interstate commerce will be protected.

We will assume that there is a certain road leading from one State directly into another. We will also assume that on this road a great deal of trucking is being carried on, a trolley road is carrying passengers throughout the day, express wagons are running and store delivery wagons are constantly driving back and forth across the boundary line of the State; at the same time, we will also assume that on this public road motor vehicles pass by the hundreds every day and that the occupants thereof are out for pleasure. It makes no difference whether the vehicles are propelled by power or drawn by animals, if any vehicle on that road which is being driven for pleasure should run into and damage one of the vehicles which is being operated for the purpose of commerce (which is likely to occur) it can readily be seen that Congress would possess the power to regulate a certain class of vehicles which travel for pleasure over interstate highways so as to insure protection to other vehicles which are engaged in interstate commerce.

The present bill of the American Automobile Association permits an automobilist who is duly licensed in his home State to obtain a Federal license. He is not restricted. He obtains an additional privilege. He gets this not because Congress desires to protect interstate commerce, but because the American Automobile Association says that automobilists who are engaged in interstate travel for pleasure are carrying on commerce. If such a proposed law provided that the automobilist must obtain a Federal license and carry a Federal tag, which would identify him in case he committed injury to any vehicle engaged in interstate commerce on an interstate highway, then the law would be valid and constitutional, since it seeks to protect interstate commerce. It is upon this theory alone that a Federal registration bill can be constitutionally enacted. The same results practically would be accomplished as sought in the American Automobile Association's bill. With the mandatory requirements would be conferred the interstate license as an incident.

Great care should be taken in framing a bill of this character. The proposed law should define what constitutes interstate highways or roads. It should be provided that all public highways and roads which directly lead from one State into another are interstate highways for the purposes of the act. The term interstate highways should also include all other streets, roads and highways which lead into any main or direct interstate highway running from one State to the other, and which are necessary or convenient in the use of said main or direct road or highway. Congress once having declared what constitutes interstate highways will then have the power to control travel thereon fully. It must not be forgotten that a person is engaged in interstate commerce if he is traveling wholly within the limits of a State or within a municipality thereof, if he is at the time engaged in a general business which is interstate in its character and his traveling is a necessary part of that business. I will make this assertion and I feel confident that I can back it up by authority, that, if I drive a wagon in the city of New York continually for four days in a week collecting packages which I expect to deliver and sell in the city of Paterson in the State of New Jersey, I am engaged in interstate commerce while I am so driving in New York City and Congress may protect me from injury which might be done to me by automobilists traveling on the city streets, compelling them to take out a Federal license.

Manufacturers' Opportunities the World Over

WASHINGTON, D. C., Apr. 4—The following report covering the market for automobiles and traction cars in Portuguese East Africa, transmitted by Consul George A. Chamberlain, of Lourenço Marquez, contains interesting information concerning the conditions which prevail in that colony and the cause why American cars are not in more general use in foreign markets:

Up to a few years ago the streets of the city of Lourenço Marquez, the capital of Portuguese East Africa, were mere rivers of sand, and transportation by automobile seemed as far off as aerial navigation. The white man was hauled laboriously through the sand in rickshaws, and women went shopping swung from Kaffir-borne poles in hammocks known as *mechillas*. During the last decade, however, wonderful changes have taken place, so that to-day Lourenço Marquez has 40 miles of macadam streets, with promise of more to follow. Sand is the curse of Portuguese East Africa. It blocks the rivers and harbors and stretches in a vast sea toward the interior, effectually cutting off the coast towns from the highlands. Besides, it makes the problem of transportation the bugbear of the planter.

The stone for macadamizing the streets of Lourenço Marquez was brought 50 miles by rail from the borders of the Transvaal, and the hauling from the local station to the place of application cost more than the quarrying, crushing and transportation by rail put together.

The transport problem of the district is further complicated by the diseases that have decimated the cattle and horses all along this coast. He who buys a horse takes an 8 to 1 chance of burying him within a year. Horse sickness defies the most careful nurture, and is still, in every feature, a mystery to science. It is said that only 2 per cent. of the stricken recover. As to cattle, the danger of loss is no less, as the mere fact of the infection of a district condemns a farmer to the disposal of his entire stock. The situation resolves itself into a choice between automobiles and donkeys, and in Lourenço Marquez and vicinity the automobiles are winning. Of the automobiles already here, one is of American make and would cost at home about $750, but so strangely do our manufacturers arrange their export business that the middleman's commissions and duties brought up the cost of the car to the local purchaser to about $1,400. During the present month—November, 1909—four automobiles have made their appearance on the streets of Lourenço Marquez, and a truck of very special construction is on the way to start the battle against the 18-inch sand of the suburbs. The truck was ordered by the local government from a European firm. The contract is most interesting. The purchase price is fixed at about $15,000, to be paid in three installments, as the car succeeds in performing the various feats of the guaranty. This guaranty assures, among other things, a carrying capacity of 4 tons through 18-inch sand at 8 miles an hour, a hauling capacity of 8 tons, and the performing of a trip under test conditions to the suburb of Marraquene, 19 miles out.

DEMAND FOR CHEAP CARS

There is a limited market here for a cheap grade of car suitable for running around town. Four have come in this month, and it is safe to predict that next year will see this number increased by twenty. The market for traction, freight, and agricultural cars, if properly worked, is unlimited. Horse sickness and tick fevers will prove unfailing allies to the manufacturer.

Some American car manufacturers have seen fit to sell their export business to New York commission houses. The manufacturer reasons thus: It costs him $800 to turn out his car. A big commission house agrees to give him $1,000 per car if it be made sole export agent. He thus makes a solid profit and is free from the trouble of studying export and founding an export department. He signs a contract and thinks he has made a successful deal, but that contract is to a large degree the destruction of his export business. The commission house takes over the car at $1,000, and contracts agencies with established firms all over the world, fixing the retail price at $1,500. The agency gets a net sum of $75 per car sold. Charges, insurance, freight, and duties, say, $225. The commission house pockets the difference, $200, just what the manufacturer made on his car.

LIMITED AGENCIES DESIRABLE

Anyone can see the dire effects such a line of procedure will have upon American competition abroad. Our medium-priced cars are wonderfully suited for the capture of new markets if they can be sold as medium-priced cars. The only way to assure this is by the establishment of direct limited agencies and undertaking the local advertising. The latter stipulation is unusual, but most important. In the first place, the American conception of advertising is just sifting into the outer world. In the second place, a foreign agent is interested in American goods solely through his pocket. He is swamped with agencies for things that would sell with a little pushing.

Unlimited agencies are a purely American invention which has entrapped many a careless firm. From a business point of view they are often disastrous. The other day one of our most solid and famous manufacturing firms—not of automobiles—conceded to one man the agency "for territory south of the equator" for a new line of manufacture.

Much Activity in and Around Boston

BOSTON, Apr. 2—In twelve weeks since the new Massachusetts automobile law, which includes a graded horsepower registration fee and an annual operator's license fee, has been in effect the receipts of the State from this source have been nearly equal to the total amount received during the year 1909. The receipts of the automobile department of the Highway Commission from January 1 to March 17 inclusive of this year were $166,681, while for the fiscal year of 1909 the total receipts were $169,973.54. For the corresponding 17 weeks from January 1 to March 17 of last year the receipts were $56,484.

So far there have been registered this year 13,058 cars against 9,100 for the corresponding period last year; 647 motorcycles against 403, and 488 manufacturers and dealers against 380. Original operators' licenses have been granted to 800 persons against 671, and 11,212 licenses have been renewed. Original chauffeurs' licenses have been granted to 493 persons, against 443, and renewed chauffeurs' licenses to 1165, against 851. As there were registered about 24,000 automobiles last year it is confidently expected that the income of the State from the automobile department this year will be considerably in excess of $300,000.

The recent automobile show and the good weather that has prevailed have stimulated the registration of cars, and the past week has been the busiest so far this year at the offices of the automobile department of the Highway Commission. Nearly 1200 cars were registered in six days and about an equal number of operator's licenses were issued. The influence of the show is seen in the registration of thirteen new dealers since the doors of Mechanics' Hall were closed.

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The old automobile will have to be brought out from its Winter hibernation, and, in order to obtain the best results from it, nothing remains but to give it the thorough overhauling it was promised last year. The temptation will be to trade it in for a new one, and the wisdom of choice will depend upon the condition of the car from a mechanical point of view and the state of the owner from a pecuniary standpoint. In any event, considering cost, it will be necessary to determine whether or not it will be less costly to purchase a new automobile than it will be to repair the old, and, in thus discriminating, good judgment must be fortified by keen perception.

If the car in hand is promising, and it should be unless it is several years of age, it should be held immune from the machinations of the novice who thinks big and does little; many an automobile has been ruined by just this class of the genus novice. The repairing of an automobile, if the work is properly done, is a prosaic undertaking, full of sad experiences, even to the man who is accustomed to this class of work, and it demands a fair display of horse sense, some skill as a mechanic, and the entire absence of anything like a desire to reform the plan of the maker.

The man who thinks he can build a better automobile than the one who may be responsible for the car that is to be repaired, should know better than to hamper his good ideas by planting them in an old automobile; they will shine better if they are contained in a positively new production, and the old automobile will not then be ruined in the undertaking.

System is everything in a repair job; it takes time to hunt for and find the parts after they are cast carelessly about, and it is even a question if the artisan will hunt for them after they are mislaid. Cleanliness is worth much, and after the parts are thoroughly cleaned they may be inspected for the purpose of determining their competence to render fit future service. It is something of an undertaking for a man of no experience to observe with certainty the value of a used part, and it may even be a job for an expert to ascertain if the structure has been rendered crystalline in service.

If the results of service do show on a part, and if the metal has "aged" up to the condition showing a crystalline structure, the best way, perhaps, is to purchase for use a new part. The crystalline structure may be corrected if the facilities for heat treating are available, provided the workman is sufficiently skilled in the art to know what to do.

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Large combinations are suspected of the people, but this attitude is not always justified. The automobile business has had an unusually rapid growth; so rapid, in fact, that there has been no semblance of competition, but, today, it is fast approaching a stage where production is so close to demand, that makers will soon come into competition one with the other. When that time comes, in the near future, as come it must, that manufacturer or group of manufacturers which is best fitted to get out good cars will get the full share of the business, while the makers with less complete or less able equipment will have to take what remains.

Equipment may mean in this connection, not alone factories, supplies on hand and connections which will yield further suitable supplies, but also men, both the men higher up and the workingmen. From the point of view of the buyer, or, as he is usually called, the ultimate consumer, such group of makers is far more satisfactory to do business with, not alone from the fact that the very size and bulk spell permanency, but also from the point of view of ability to supply the desired article, which a less well-equipped firm would not be able to furnish. These two ideas taken together mean satisfaction, first, for the immediate present, and, second, for the more or less remote future.

As to equipment, that factory is best equipped which possesses the largest number of new and suitable tools, which has the best shipping facilities, which has old and seasoned workmen tuned up to that company's class of work through many years of service, which is closest to its market, nearest or most closely connected to its source of supplies, and which is best equipped as to factory and selling organization. In a group of makers, allied for mutual advantage and betterment, it is possible to improve on some of these items, however well they may have been taken care of in the past. Thus, to cite an item, one can buy, not alone more cheaply, but also better in every other way, for 5,000 cars than for the much smaller number of 500. In this and other ways a group of makers in close touch can serve better than the same number of makers acting independently and competing somewhat with one another.

More News Jottings from Motor Center

DETROIT, MICH., Apr. 4—Among the most recent American concerns to invade the Canadian field is the Anhut Motor Car Company, of Detroit, which has purchased the Chatham Motor Car Company, of Chatham, Canada, and will devote the plant to the production of Anhut Six cars. The capital stock of the company has been increased from $150,000 to $300,000 to take care of this expansion.

The Stuart Commercial Car Company has been incorporated at Detroit, with a capital stock of $300,000, of which $65,000 has been paid in. The concern will manufacture power wagons.

There is no better indication of the growth of the automobile business than to watch the increasing output of drop forgings, and the effect this product is having upon the plants devoted to this class of work. The Anderson Forge & Machine Company, of Detroit, Mich., reports that it is now putting out 1,000,000 pounds of steel per month in the form of drop forgings, and that a new plant, which is now under way, will be complete and ready for occupancy by July 15.

The Detroit-Dearborn Motor Car Company has increased its capital stock from $50,000 to $100,000.

The Commercial Motor Car Company, of Detroit, has been incorporated with a capital stock of $30,000.

The capital stock of the Detroit Carriage Company has been increased from $50,000 to $100,000.

Wisconsin State Endurance Run Insured

THE Milwaukee Sentinel has donated a trophy, valued at nearly $1,000 as an award to the winner of a reliability or endurance run, open to Wisconsin owners and dealers. The prize will be held by the winner for a year and will be competed for annually. The winners' names will be inscribed on the cup.

George A. West, treasurer of the Wisconsin S. A. A. has been selected as chairman of the contest committee which will have charge of the annual event upon which the award will be based.

Plans for the run this year have not yet been completed, but it is certain that the tour will cover a large part of the State and may require from three to six days. A tentative plan formulated by President M. C. Moore of the W. S. A. A., contemplates a run of six days, extending from Milwaukee to Madison; Madison to La Crosse; La Crosse to Eau Claire; Eau Claire to Merrill; Merrill to Appleton and back to Milwaukee.

It is probable that the run will be made in July, although a definite date for it has not been set. Wisconsin motordom is highly interested in the event and inquiries from various parts of the State indicate that the entry list will be representative and likely to exceed in point of size anything of its kind ever given in the Northwest.

Coming Events in the Automobiling World

Apr. 6-9.....Watertown, N. Y., Automobile Show, Watertown Automobile Dealers' and Manufacturers' Association, in the State Armory.
Apr. 6-9.....Duluth, Minn., Armory, First Annual Duluth-Superior Automobile Show.
Apr. 7-9.....Kalamazoo, Mich., National Guard Armory, Automobile Show, Kalamazoo and Southern Michigan Automobile Dealers.
Apr. 9-16.....Elmira, N. Y., State Armory, Automobile Show, Elmira Chamber of Commerce.
Apr. 11-16.....Harrisburg, Pa., Kelker Bldg., Automobile and Sportsman's Show, Harrisburg Automobile Dealers' Association. B. R. Johnson, Manager.
Apr. 11-16.....Erie, Pa., Meyer Block, Automobile and Motorcycle Show.
Apr. 23-29.....Bangor, Me., Auditorium, Second Annual Eastern Maine Automobile and Motor Show. J. Henry Graham, Manager, Old Orchard, Me.
June 20-July 6....Detroit, Mich., Industrial Exposition, Detroit Board of Commerce.
Jan. 7-14, 1911....New York City, Madison Square Garden, Eleventh Annual Show, Pleasure Car Division, Association of Licensed Automobile Manufacturers.
Jan. 17-24, 1911...New York City, Madison Square Garden, Eleventh Annual Show, Commercial Division, A. L. A. M.
Feb. 13-25, 1911...Chicago, Coliseum, Tenth Annual National Automobile Show, N. A. A. M.

Races, Hill-Climbs, Etc.

Apr. 5-6.....Savannah, Ga., Endurance Run to Jacksonville, Fla., Savannah Automobile Club.
Apr. 6-9.....Memphis, Tenn., National Aviation Meet, Aero Club of Memphis (member Aero C. A.).
Apr. 8-10 & 13-17.Los Angeles, Cal., Inaugural Meet, Motordrome.
Apr. 30-May 2....Philadelphia Roadability Run to Atlantic City, Quaker City Motor Club.
May 2.....Flag to Flag Endurance Contest, Denver, Col., to City of Mexico.
May 5-7.....Atlanta, Ga., Track Races. Atlanta Automobile Association.
May 9-11.....Harrisburg, Pa., Fourth Annual Reliability Contest to Atlantic City and Return.
May 21-22.....Bay Ridge, L. I., Club's Endurance Contest Around Long Island, Crescent Athletic Club and Long Island Automobile Club.
May 30.....Bridgeport, Conn., Hill-Climb up Sport Hill, Automobile Club of Bridgeport.
June 11.....Wilkesbarre, Pa., Annual Hill-Climb up Giants' Despair, Wilkesbarre Automobile Club.
June.....Cincinnati, Seventh Annual National Reliability Run for Glidden Trophy, through the Southwest.
June.....Worcester, Mass., Hill-Climb up Dead Horse Hill, Worcester Automobile Club.

Foreign Shows and Races

Mar. 31-Apr. 8....French Spring Wheel Competition.
Apr. 2-24.....Turin, Italy, Automobile Show.
Apr. 27-28.....Brooklands, England, Two-Day Meeting.
May 1-Oct. 1.....Vienna, Austria-Hungary, Automobile and Aviation Exposition.
May 28-June 9....St. Petersburg, Russia, Automobile Exhibition.
May 29.....Copa Catalunya, Voiturette Race of the Royal Automobile Club of Spain, near Barcelona.
June 2-8.....Prince Henry (German) Touring Competition.
June 13-18.....Scotland, Scottish Reliability Trials.
June 20.....French Voiturette Race.
June 21.....French Stock-Car Race.
June 22-July 5....Russian Touring Competition, St. Petersburg to Moscow; also Commercial Vehicle Trials.
June 27.....Speed Trials at Kiev, Russia.
July 12-18.....Ostend, Belgium, Automobile Week.
July 20-25.....Boulogne, France, Automobile Week.
Aug. 1-15.....Ardennes, France, Meeting.
Aug. 15-Sept. 15..French Industrial Vehicle Trials.
Aug. 21.....Salon, France, One and Five Kilometer Trials.
Aug. 28.....Mont Ventoux, France. Hill-Climb.

A.C.A. RULES FOR CERTIFIED MOTOR TESTS

DETAILED rules to govern certified tests under the jurisdiction of the Automobile Club of America have been formulated by the Technical Committee of which A. L. McMurtry is chairman. The rules have been framed to cover tests of the merits of motor vehicles generally and all their material accessories.

Special stress is laid upon the use of such tests as advertising and publicity matter by the entrants and a definite agreement is insisted upon by the club that the entrant shall accept the official record and agree to the publication of such by the Technical Committee and he is also required to submit proposed publicity and advertising matter based upon the club certificate to the committee, prior to publication.

The rules are as follows:

1—Object: The object of the tests is to determine the merits of a motor vehicle as a whole or in part, or an accessory, under various conditions.

2—Certificates: The Club will give a Certificate of the actual performance during the test and official representative or representatives are to be provided for the test, by the Committee. The certificate shall be a record of the test, containing such details of the motor vehicle or part thereof, under test, and any observations the Committee may find desirable. A copy of the results shall be published in the Club Journal.

3—Interpretation of Rules: The interpretation of these rules shall rest entirely with the Technical Committee which, may, from time to time, alter, add to, or omit from them, and may, in the case of any particular test, modify the rules to suit a particular case.

4—Postponement: No test shall be postponed or abandoned without the consent of the Committee, except that on the day of the test the Committee's representative or representatives may order a postponement on account of the weather, road conditions, illness, or contingencies beyond the control of the Committee.

5—Time of Test: Unless otherwise specified, a day's test shall consist of eight hours' duty, at the expiration of which time the motor vehicle shall be placed under lock and key and subject only to the inspection of the Committee. Time of starting the test shall be determined at least forty-eight hours previous to the start.

6—Supervision: The motor vehicle shall be under the supervision of the Committee, from the time at which it is presented for trial until released by the Committee.

7—Extension of Test: The entrant may, at any time before the completion of the test, give notice in writing to the Committee, that he wishes to extend the duration of the test, subject to the approval of the Committee.

8—Adjustment and Repairs: All manipulation, adjustment or repairs shall be carried out only by the entrant or his employees.

9—Entries: Every entrant shall state the nature of the test and the number of days to be occupied. The entrant shall, with the consent of the Committee, be entitled to alter the duration of the test on paying the additional fees. After receipt of the entry the entrant will be notified of the day fixed for the commencement of the test. The Committee reserves the right to refuse any entrant without giving a reason or to limit the length of any test at its discretion.

10—Withdrawal: The entrant may, at any time before completion of the test, give notice to the Committee that he wishes to withdraw from the test, and shall state his reason. In the event of such notification the motor vehicle shall remain under the supervision until the cause thereof has been investigated and the motor vehicle released by the Committee.

11—Inspection: The Committee shall notify the entrant when an inspection of the motor vehicle or parts thereof, under test, is to be made, so that the entrant may have a representative present during such inspection.

12—Foul Practices: The Committee shall stop immediately a test of a motor vehicle the entrant or employee of which shall be guilty of misbehavior or unfair practice in connection with the test.

13—Advertising the Test: The entrant agrees to accept the official records of the Committee and authorize the Committee to publish them in such manner as the Committee thinks fit. The entrant may publish only the full and complete certificate issued by the Club. In the event of his desiring to publish by way of advertisement or otherwise, any other matter relative to the test, he shall submit proof of such matter to the Committee before its publication and he undertakes not to publish any such matter until he has received the written authority of the Committee, in which case he may use the words "Published with the authority of The Automobile Club of America."

14—Responsibility for Damages: An entrant shall have no recourse against The Automobile Club of America, the technical committee of the Automobile Club of America or any of its officials, employees or representatives under any circumstances.

15—Fees: Fees for the test shall be determined by the Committee in accordance with the nature and duration of the sest, and under ordinary circumstances will not exceed $25 per day.

Application: Every application for a test shall be made upon an official application form of the Committee and shall state the nature of the test, the number of days to be occupied and the name of one member of the Club guaranteeing the account.

Certified Fuel Consumption Tests—Regulations

1—Object: These tests are to ascertain and record the fuel consumption of a car.

2—Rules: These tests will be held under the Rules for Certified trials.

3—Certificate: The Committee reserves the right to add to the Certificate a record of the run, or any other observations concerning the test. (Such as weight and make of car, horsepower of engine, bore and stroke, type of carbureter, i. e., automatic auxiliary air supply, hand-regulated air supply, mechanical fuel feed, etc., method of control of engine power and speed, including whether governed, controlled by accelerator pedal, variable valve lift, or by the independent throttling of one or more cylinders, gear ratio, type of body, wind area, make and size of tires, and average speed of car in miles per hour.)

4—Running Time Per Day: A day's Road Test shall not exceed 150 miles, except in the case of a continuous run exceeding twelve hours' duration.

5—Passengers: The full complement of passengers or equivalent ballast which shall not consist of spare parts, shall be carried throughout the test, and the total weight thereof shall amount to not less than 132 lbs. per passenger seat. The entrant shall be responsible for filling all the seats except in the case of the representatives of the Club. The representative or representatives shall have the choice of seats. No extra passenger shall be allowed to ride on the floor or step.

6—Muffler: An efficient muffler must be fitted, and is defined as follows: Apart from any question of back pressure, an efficient muffler is one which renders the separate impulses of the exhaust gases from an engine indistinguishable under all ordinary running conditions, at the distance of 30 feet from the side of the car in an open road and which is practically gas-tight everywhere except at the proper outlets.

7—Postponement: No test shall be postponed or abandoned without the consent of the Committee, except that on the day of the test the Committee's representative or representatives may order a postponement on account of the weather, road conditions, illness, or contingencies beyond the control of the Committee.

8—Arrangements must be made to fit any tank or other device which the Club may consider necessary.

9—Nature and Quality of Fuel: A sufficient quantity of fuel may be taken from the tank by the representative for such tests as the Club may consider necessary to ascertain its nature and quality.

10—Speedometer and Odometer: A reliable speedometer and odometer must be fixed to the car and checked for accuracy on the Club dynamometer.

11—Makes of Tires: The car must be fitted with the regular tire equipment as specified in the manufacturers' catalogue. If the tire equipment is optional the Committee will select the make of tire as fitted to the largest number of cars of that make and type.

12—Tire Pressure: The air pressure in the tires must not be greater than specified by the tire manufacturer.

Certified Tests of Motors

1—Object: The object of the test is to subject a motor to a test of comparatively short duration, representing the equivalent of a considerably longer period in ordinary use.

2—Rules: The tests will be held under the Rules for Certified Tests.

3—Number of Cylinders: These Regulations shall apply for any motor, irrespective of the number of cylinders.

4—Fuel and Oil: The fuel will be supplied by the Committee, the quantity and quality to be noted. Lubricating oil may be supplied by the entrant, the quality to be recorded.

5—Temperature: The temperature of the cooling water shall be recorded and the water supply must not be less than 120 degrees Fahrenheit.

6—Certificate: The certificate shall show the results of the following tests:

(a) The fuel consumption on the dynamometer.

(b) The output of the motor as specified by the entrant maintained for a period of two hours, or any multiple thereof (at the declared number of revolutions), obtained without interruption of the test.

(c) The minimum B.H.P. which can be obtained for 15 minutes below some limiting speed to be declared by the entrant.

(d) The B.H.P. which can be maintained for the same period at one-half the limiting speed declared by the entrant.

(e) If required by the entrant, the miximum B. H. P. at 5 or more different speeds between and inclusive of the B.H.P., determined at the declared maximum and minimum speeds. These results to be those obtained with no other carbureter regulation or variation than the adjustment of air supply.

(f) A record of all repairs and adjustments which may cause stoppage of the engine.

(g) Bore, stroke, offset of cylinders (if any), weight of motor, normal speed, maximum speed, ignition system and make of carbureter, and any other observations the Committee may find desirable.

ANNUAL ELECTION OF A.C.A. APRIL 12

The Automobile Club of America will hold its annual meeting and election of officers, April 12 at the clubhouse, 247 West Fifty-fourth street. The following candidates have been nominated: President, Henry Sanderson; first vice-president, John E. Borne; second vice-president, Robert Lee Morrell; third vice-president, Edward Shearson; treasurer, Finis E. Marshall; governors (to serve four years, from April, 1910), Dave H. Morris, Albert R. Shattuck and E. H. Gary. Governor (to serve in place of Cornelius Vanderbilt, resigned, until April, 1912), Alfred Ely; governor (to serve in place of Horace Porter, resigned, until April, 1913), George Moore Smith. Widespread interest has been aroused, and an unusually full attendance is expected.

THOMAS B. JEFFERY DIED SUDDENLY IN ITALY

THOMAS B. JEFFERY, president of Thomas B. Jeffery & Company, manufacturers of the Rambler, died suddenly at the Grand Hotel at Pompeii, Italy, Saturday night. Mr. Jeffery was touring Europe with his wife, having left Kenosha, Wis., January 21, planning to spend at least four months abroad for rest and pleasure.

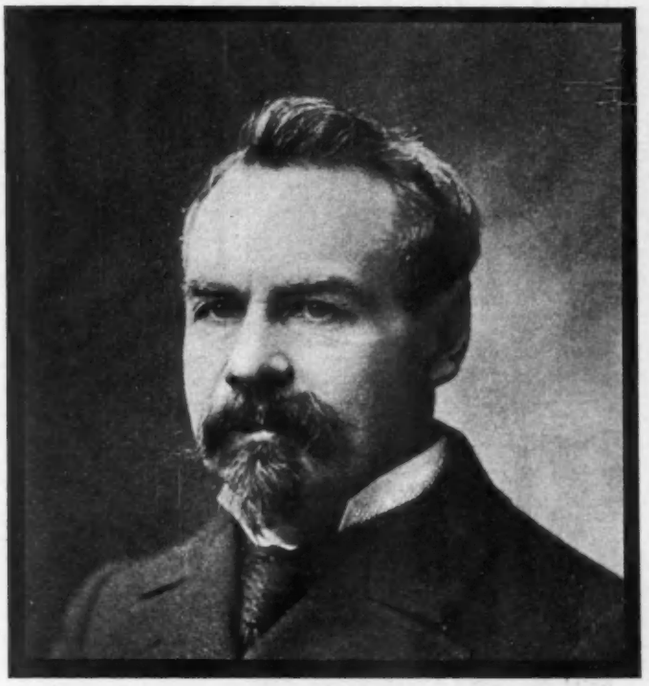
He was born at Stoke, Devonshire, England, February 5, 1845, and came to America when eighteen years of age. He located at Chicago and entered his trade, that of making astronomical and other instruments of precision.

He was the maker of the patent office models of the railway velocipede and later manufactured that device. In 1878 he joined the late R. Phillip Gormully in the manufacture of the Rambler bicycle, under the firm style of Gormully & Jeffery until 1897, when the business was sold to the American Bicycle Company.

Prior to this sale, Mr. Jeffery had been experimenting with the automobile and about ten years ago he purchased the old Sterling bicycle plant at Kenosha and commenced the manufacture of the Rambler automobile. He was the inventor and patentee of the clincher pneumatic tire.

Mr. Jeffery was married to Miss Kate E. Wray, of Chicago, in 1874. Besides his widow, he leaves two daughters and two sons, the latter being Charles T. Jeffery, who will succeed his father as head of the company, and Harold W. Jeffery. Charles T. Jeffery has been manager of the concern for several years.

The remains of Mr. Jeffery will be shipped back to this country and interment will probably be at Kenosha.



Thomas B. Jeffery, Maker of Rambler Automobiles, Who Is Dead

RICH PRIZES FOR ATLANTA WINNERS

ATLANTA, GA., Apr. 4—The card of events is out for the Atlanta Speedway races which will be held May 5, 6 and 7 over the two-mile Atlanta track.

The list contains only two long races, both at 200 miles and both for trophies of an advertised value of $10,000.

One is the "Atlanta Speedway Trophy" and is for cars of 301 to 450 cubic inches displacement. The other is for the 451 to 600 class cars and is called the Atlanta Automobile Association trophy and has added prizes of $1,000 and $500.

The one mile time trials have been made better worth while than ever before, with $150 for the car making the best time, $500 for the car breaking the present track record and making the fastest time, and $150 for every other car breaking the present record. The only other novelty is an Australian pursuit race.

The program includes twenty contests ranging all the way from a single mile dash free-for-all; ten, twelve, twenty, forty, fifty and sixty mile races, to the 200 mile-events. About $6,000 in cash and eleven cups and medals will be distributed.

VANDERBILT CUP RACE OCTOBER 1

Preliminary announcement has been made of the sixth annual competition for the Vanderbilt Cup, which will take place on the Long Island Motor Parkway Saturday, October 1, starting at 9 o'clock a. m. The course will be the same as that used in 1909 and will be 12.64 miles, with four turns, all well banked. Twenty-two rounds will be made, the total mileage being 278.08. The race will be run rain or shine. In addition to the cup, there will be a purse of $2,000 and a bronze placque by Tiffany, awarded the winner. The entry fee is $500 a car.

W. W. WALLACE, ADVERTISING MAN, DEAD

W. W. Wallace, who has been advertising manager of the Berger Manufacturing Company of Canton, Ohio, for many years, died March 29.

SAVANNAH-JACKSONVILLE ROAD RUN

SAVANNAH, GA., Apr. 6.—Twenty-one of the twenty-two entrants in the Savannah-Jacksonville tour completed the run today, a distance of 98.1 miles. No serious accidents marred the sport. The roads were in excellent condition except for three miles south from Darien and at King's Ferry.

Mrs. L. W. Hazard drove her ten-horsepower Maxwell over the course with a perfect score. Besides Mrs. Hazard, those who secured perfect scores were as follows: J. L. Highsmith, Maxwell; Chris Jacobs, Hupmobile; H. B. Flanders, Buick; L. R. Akin, Buick; W. H. Towle, Maxwell; Darwin B. Hull, Buick; The Rev. Francis Alan Brown, Maxwell; Henry A. Brantley, Maxwell; W. C. Thompson, E-M-F; W. C. Adams, Maxwell; R. S. Brown, Cole; Robert Brockett, Maxwell; Harvey Grander, Lancia; Eugene Maner, Acme; N. G. Brown, Packard and A. W. Solomon, Stevens-Duryea.

ART POSTER FROM MAGNETO FIRM

Beautiful just describes the art poster which is now being distributed by the K-W Ignition Company, Cleveland. This poster is 14 1-2 inches wide by 35 inches high and a work of art.

The idea of the spirit of the K-W magneto is carried out by a beautiful female form which rises in vapory outline from the spark-plug cables connected to the magneto. The figure continually grows stronger until it stands out against a starlit sky in all its beauty of line and color, while the red flame which the magneto produces and which is shown jumping between the two forefingers casts a warm glow down on the face and rounded shoulders, the beauty of which is hard to describe.

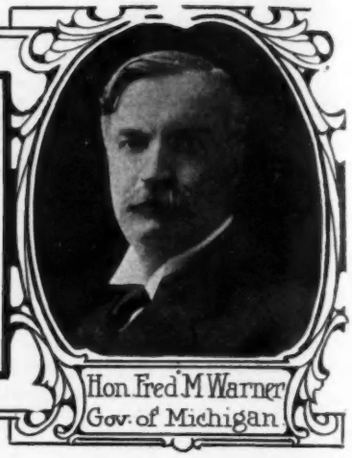
SALE OF WINTON OFFICIALLY DENIED

The rumor generally circulated last week that the Winton Motor Carriage Company had been sold to the United States Motor Company is officially denied by Alexander Winton, president of the Winton company.

A·L·A·M· OFFICIALS

COMMITTEE

FIRST ANNUAL BANQUET



THE Hon. Fred M. Warner, governor of Michigan and the chief speaker on the list of those who will address the assembly, at the first annual dinner of the Association of Licensed Automobile Manufacturers, Thursday evening at 7 o'clock at the Hotel Astor, was a particularly happy and appropriate choice for that duty.

Governor Warner is the chief executive of the State in which over half of all the motor cars of the country are made. The industry in Michigan, is one of leading lines of endeavor of the citizens of that State. There are thirty-seven manufacturing plants devoted to the making of motor cars in Michigan. The annual product of the State is approximately 150,000 cars, valued at $190,000,000. In addition to this stupendous amount, over half of the accessory product of the country is utilized in the building of Michigan motor cars, thus adding the financial, economic and industrial potentiality of over 150 manufacturing establishments to the grand total.

Thus when Gov. Warner speaks about the automobile, his words will have a peculiar significance. The guest of honor traveled from Detroit in a private car and was received with formal ceremony as well as enthusiastic informal welcome.

The banquet hall of the Hotel Astor was magnificently decorated for the affair and a short time before the lists were closed, it was announced that practically the full number of guests expected, would be present, in all about 200. Acceptances of the invitations had been received from three-quarters of the members. Governor Warner is an optimistic conservative and his address is awaited by the manufacturers with something more than curiosity.

Job Hedges, the toastmaster, is one of the noted wits of New York and is a radical in his treatment of many interesting subjects, including the automobile. William H. Edwards, another of the speakers, head of the street cleaning department of the metropolis, is a forceful talker whose ideas have proved to be notably interesting. Col. Charles Clifton, president of the association is a careful speaker whose words carry much weight and influence and Arthur Brisbane, most widely known for his writing, is unusually brilliant in the field of oratory.

The banquet will undoubtedly become a regular feature of the activities of the A. L. A. M. In one sense such gatherings are diversions, despite the importance and vital interest of the topics discussed. They give the opportunity for social contact and acquaintance under favorable conditions. The tone of such a function as the first annual banquet of the A. L. A. M. is of the highest class, being almost formal and official in its character.

The membership of the association includes eighty-three of the leading motor car companies and under the plans of the committee in charge of the banquet arrangements, only three invitations were sent to each member. The object sought was to make the attendance representative of the whole association, to as large a degree as possible. This plan will have the effect of eliminating anything like a dominating influence, based upon a large local attendance.

The dinner itself has been planned upon the most complete lines of the celebrated hostelry where the function will be held. The menu will be especially elaborate, and all the details set in harmony with it.

The general trend of the addresses will be the past, present and future of the automobile and in that wide scope, the speakers will have an opportunity to touch upon a thousand and one subjects of direct moment to the industry.

Aside from the regular list of speakers there will be several impromptu addresses and discussion of the topics treated in the formal toasts.

The tendency toward centralization, which has been impressively shown by the trend of events recently, will undoubtedly receive a considerable amount of attention. The trade generally is much interested in the gathering on account of the representative character of the men who will be here, particularly in connection with the idea of the reported mergers and rumors of mergers in the industry.

A.A.A. GIVES OUT 1910 GLIDDEN RULES

(Continued from page 672.)

438—A seal broken in the day will be replaced the evening of that day at the garage by the promoter's technical committee.

439—Breaking Seal—There will be no penalty for breaking a seal.

440—Lubrication—At the completion of each day's run—except the final day—after the cars are garaged, ½ hour will be given each contestant for lubricating all parts of the car, such as crankcases, filling and turning of grease cups, motor, transmissions and other parts. This will be done under the supervision of the observer and a member of the promoter's technical or contest committee. Seals will be broken to permit of properly lubricating the car during this half hour.

DRIVERS

441—Drivers may be changed as often as desired, but report of same is required to be made to the referee and the regular and substitute drivers shall be named in the entry blank. In case of illness, emergency drivers may be used. Drivers shall report at the official garage or park ½ hour before the announced starting time for the day and they, together with the observers, will be placed in charge of cars, whereupon they will immediately proceed to the starting line and take their proper places ready for the start. Drivers must not rely upon information obtained from the observers as to the route to be followed or as to any question regarding penalties.

OFFICIAL HEADQUARTERS

442—There shall be an official headquarters where all announcements shall be posted on a bulletin board before and after a contest.

443—Before the start of any contest, all drivers, observers and entrants shall attend a meeting held for the purpose of instruction as to the intent of these rules. This meeting shall be in charge of the referee.

444—When the contest exceeds one day in duration an official bulletin board shall be displayed at a known headquarters each night, giving such additional information as may be required. Failure on the part of drivers, observers or entrants to attend the meeting of instruction and to consult the official bulletin board displayed at the headquarters shall be at their risk.

START

445—The time of starting shall be announced by posting on the bulletin board, or otherwise, the evening previous to each day's start. Cars will be started each morning at the hour announced the evening previous, the different cars starting at one minute intervals.

446—Cars shall start in the order of their presentation at the starting line and without regard to classes or divisions.

OFFICIAL NUMBERS

447—Each car shall have its official number prominently displayed on each side of the hood, painted on the radiator in front, and if possible, on the rear of body.

448—The name of the car in letters 4 inches high may appear upon the sides and upon the front and rear.

PACEMAKER

449—Each day's contest shall be preceded by a pacemaker; and by any entrant or representative thereof who passes the pacemaker shall be disqualified. The referee shall go with the tour in the pacemaker's car in order that he may be accessible to contestants at the end of each day's run. If the pacemaker's car breaks down or is compelled to travel at a rate of speed so slow as to impede the progress of the tour, his flag shall be transferred to the first suitable car overtaking him, which car shall thereafter become the pacemaker's car, subject to the same conditions, until such time as the official pacemaking car can again perform the duties.

CLASS A AND DIVISIONS

Competing cars shall be divided into the seven divisions of class A, as follows: Rule 400.

Division 1A	$ 800	and	under
Division 2A	801	to	$1,200
Division 3A	1,201	to	1,600
Division 4A	1,601	to	2,000
Division 5A	2,001	to	3,000
Division 6A	3,001	to	4,000
Division 7A	4,001	and	over

DAILY RUNNING TIME

450—The following average speeds shall be maintained by the cars in the respective divisions of class A:

Divisions 4, 5, 6 and 7.....20 miles per hour
Divisions 2 and 3.....18 miles per hour
Division 1 .....16 miles per hour

451—All cars to avoid penalty will arrive at checking stations as per their schedule, plus additions, if any, to the running time for delays on account of tire troubles. Rule 420.

452—The referee may, if the necessities of the weather or road conditions demand, vary the speed schedules, announcement of any change being made by the starter previous to the start of the day's run to which the change shall apply, or during a day's run at any checking station by the checker at the designated station where the change is made, due notice being given to all contestants who shall acknowledge receipt of such notice by signing the checker's card.

CONTROLS

453—The official station established at the end of each day's run where the cars are officially checked, shall be known as the night control. The official stop for luncheon on each day's run—if there be one—where cars are checked in and out shall be known as the noon control.

454—Each contestant shall be ready each morning to check out at the time announced. Checkers shall be at their stations at that time prepared to start the cars. The time of departure each day shall be entered on the observer's card.

455—Each entrant, or official representative of such entrant, upon starting each day's run, shall sign a statement submitted by an official of the contest fixing the time of his departure, and shall be given a card indicating such time, which card shall bear the signature of said official. Failure to comply shall result in disqualification.

456—Controls and checking stations will be indicated by a flag with a white field and diagonal bar of red.

457—The referee may establish such checking points as he may deem proper. Each car shall be checked upon passing the established checking points and if ahead of time at the noon or night controls may immediately check in.

458—No car will be checked either in or out without its observer.

459—There shall be established at the close of each day's run a parking station, in which all competing cars shall be stored. The station shall be in charge of an official representative of the promoter's technical committee.

460—No work may be done on the cars while in the official garage or parking station, except lubrication during the half-hour allowed at the end of each day's run. See Rule 404.

461—Following the registration at each night control, each car shall be delivered into the custody of the officials of the tour at the official garage or parking station to be by them held at the owner's risk, and kept under direct charge and supervision of such officials or their agents until the time for starting on the following morning. Immediately after registration at night controls and before delivery to the official garage or parking station, the car may deliver the occupants—other than the driver and observer—and baggage at hotel and then must immediately proceed to the parking station. The observer must not leave the car until it is parked.

462—Passengers and baggage may be taken on at the parking station after the car has been delivered to the driver and observer but before checking out in the morning, or at the hotel after checking out when no time shall be allowed.

INTERMEDIATE CHECKING

463—Checking stations shall be established in so far as may be necessary to stop speeding. Each driver shall receive a card when checking out in the morning which shall name the checking stations and the time the car is due at each station, so that he may estimate his running time during the entire day. There shall be no appeal from the time registered by the official watches; drivers and observers shall be required to rectify their watches each morning with the official time.

464—Cars cannot check in ahead of time, except at the noon and night controls.

OBSERVERS

465—Each entrant shall furnish at his own expense one official observer for each car entered by him. All observers shall be acceptable to and subject to the instructions of the promoter.

466—The entrant must arrange for the care and keep of his drivers and observers and pay any expenses connected therewith. He must also carry during the contest the baggage of each observer furnished by him.

467—If the entrant is a motor car manufacturer or dealer, or in any way connected with the manufacture or sale of motor cars, each observer furnished by him shall be:

A—A person who has been regularly and exclusively employed by the entrant by whom he is nominated for a period of not less than 3 months immediately prior to the contest, or

B—The entrant himself or an officer or director of his business, or

C—A dealer in the car made by the entrant, or

D—As owner of a car by the entrant.

468—If the entrant is not a motor car manufacturer or dealer, the observer furnished by him shall be satisfactory to the promoter.

469—Each observer shall be assigned to a car and shall ride each day in a different car and no person shall serve as an observer on any car in which he has any direct or indirect pecuniary interest.

470—Observers shall report each morning at the official garage or park ½ hour before the announced starting time for the day, and take charge of the cars to which they have been assigned.

471—Each observer will be responsible for the tools of each car, as per rule 417.

472—Each observer must note the length of time in minutes and fractions of each stop made; if the motor is stopped or if any work is done, and also record what work was done on the car during the stop, how many persons were working, tools used and how long each person was working. See rules 485 and 521.

473—In case of breaking a seal, the observer will note the seal broken and must report how many times thereafter access was had to the part or parts protected by the said seal.

474—The observer must see that the running car is stamped or marked by the checker at each control or checking station and that his car does not pass a control or checking station before the time marked upon the running card, except at the noon and night controls, and also that the route is followed.

475—The referee shall be empowered to suspend any observer who neglects, is incompetent, or for any other reason fails to fulfill the duties assigned to him, and to provide a suitable substitute at the expense of the entrant by whom the suspended observer was nominated.

476—It shall be the duty of each observer under all conditions and without evasion of this rule for any reason whatsoever to remain with the car until he has been relieved by the chief observer or obtained the driver's signature to a statement that he has withdrawn from the contest and to report every detail of the performance of the car to which he is assigned, and all persons who operate, repair, assist or perform any action connected therewith.

477—If an official observer shall desert a disabled car without first obtaining the driver's signature to a statement that he has withdrawn from the contest, the entrant who appointed such observer shall be disqualified and must either withdraw from the contest altogether or continue as a noncontestant. By desertion is meant leaving the car without taking with him the driver and passengers. This rule will disqualify but one of the cars of an entrant in case of multiplicity of entries.

478—In addition to the surveillance of the cars in which they are riding, observers shall be required in so far as possible to make note of any other car which may be laid up alongside the road and whether the work being done upon it appears to be done on the tires or on the machinery and on what part af the car.

479—At the end of the day's run, the observer must remain

with the car throughout the half hour allowed the driver in which to oil his car, rule 440, and when this is done, leave the car at the same time and in company with the driver—and deliver to the chairman of the technical committee or his delegated representative the running card, after obtaining the signature of the driver upon said card and signing same himself. The driver shall in no case be permitted to return to a car without the observer.

480—Should any objection be made by the driver to the record, a report may be immediately made to the chief observer and by him it may be referred if necessary to the referee for settlement. In the event of a dispute as to facts the referee may require the driver to state his objection in writing. The record may also be inspected by any other properly authorized representative of the entrant, who shall also have a right to register an objection and submit proof in support thereof.

481—At a checking station, or at any regular stop, should the observer wish to leave the car he must not do so until relieved by some official of the contest, who, at the same time, must appoint a relief observer, who shall remain with the said car until the regular observer returns to it. After he returns to the car, the regular observer must receive a report, orally or otherwise, from the relief observer as to whether anything was done on the car during his absence.

482—Observers must not interpret rules for entrants or drivers and cannot say what work may or may not be done without danger of penalization, their duties being solely to record what is done and the exact length of time consumed in doing it.

483—In case of a tire repair when the engine is running the observer shall sign and hand to the driver a printed form on which is filled in the time consumed and see that the time is added to the running time, as provided for in rule 420.

484—In the event of sickness or an accident to an observer, which shall make it an impossibility for him to remain with the car, or secure a substitute properly authorized, he shall select one of the passengers of the car as a substitute observer, who shall perform all of the duties pertaining to the position, and shall, in addition thereto, have his record signed by all the occupants of the car during the time he is on duty.

485—When any work whether under penalty or non-penalty conditions is being done on different parts of the car, making it impossible for the observer to properly watch each operation, the observer may compel one of the workmen to stop until such time as he can properly watch him.

ROAD REGULATIONS

486—Entrants and official representatives of entrants shall conform to all laws, ordinances and rules of the road, and any entrant or official representative of such entrant violating any of the provisions of these rules, or who shall fail to show due consideration to the officials or other participants in the tour, or other users of the highways, may be disqualified or penalized, at the discretion of the referee.

487—Any car whose owner or driver shall be arrested for a violation of speed laws, or of any law or ordinance, may be disqualified or penalized, at the discretion of the referee.

488—When road conditions are so bad that a car cannot get sufficient traction to move, or is ditched, and reasonable effort has been made to extricate it, towing or other external means may be used to relieve the immediate distress only, but under no circumstances shall a car enter a night or any other control except under its own power. During such work of extrication the passengers need not necessarily remain in the car and may assist in the work. When towing or assistance from any external source shall have been received by a car its observer shall make a full and complete report to the referee, giving time, place, conditions, distance of tow and any other details. The sense of this rule is not to permit the towing of a car for any considerable distance.

489—All replacements, adjustments and repairs shall be done only during the daily running time.

490—The pacemaking car shall precede the contestants not less than 15 minutes ahead of the first car and with instructions not to exceed the running time of division 7 between any two checking stations. Where local conditions are factors, modifications of this rule may be made by the referee, due notice of same being given to contestants.

491—Contesting cars must not pass the pacemaking car unless it is running behind its schedule. Should a contesting car pass the pacemaking car it takes the pacemaker and his flag and must set a pace not in advance of that which the pacemaking car should have set.

492—Should the contesting car fail to maintain the proper pacemaking pace, it must surrender the pacemaker's flag to the next car that is suitable to take up the pace.

493—The pacemaker's flag shall be a navy blue field.

494—Cars unintentionally leaving the course must return to it at the point whence they left, under penalty of disqualification.

495—Cars intentionally leaving the course to make repairs may be disqualified, at the discretion of the referee.

NON-PENALTY ALLOWANCES

496—At noon or night controls, tanks for lubricating oil, gasoline and water may be filled without penalty.

497—For replenishments of oil, gasoline or water at any other places the penalty is 3 points for each occurrence.

498—Oil or grease may be added to or may be drawn off the various cases when necessary without penalty during the half hour allowed for oiling at the end of each day's run. Rule 440.

499—Recharging of batteries will be allowed at any time, but all work in connection therewith must be done in the presence of the observer.

499A—Brakes may be adjusted without penalty at Memphis, Tenn., and St. Joseph, Mo., under official observation.

499B—Carbureters may be adjusted for air or gasoline at night controls during ½ hour.

499C—Spark plugs may be charged without penalty at night controls during ½ hour allowed for oiling.

TIRES

See rules 419 and 420.

PROTESTS AND DISQUALIFICATION

500—A written protest may be filed with the referee by any participant in the tour, but must be accompanied by the sum of $25. If the protest is not sustained, this sum will be forfeited to the contest board; but if the protest is sustained the protest fee will be reurned to the person making such deposit. No protest not conforming to the above requirements will be considered. Each protest will be acted upon at the earliest practicable moment.

A—Any protests as to unfair rulings, foul driving, routes, etc., shall be made within 12 hours after the occurrence.

B—Any other protests may be made during the tour or within 24 hours after the tour is concluded and before any award is made.

501—No entrant or his official representative shall be disqualified until he shall have been notified of the act complained of, and if the act be denied, he shall be given a hearing, after which a decision shall be rendered. Upon notice of disqualification, the referee may compel him to cease to run in the contest and in that event the official numbers shall be removed from his car, and such entrant shall not receive any certificate, but shall be mentioned in the records as having been disqualified, and no entrant of any car that may be disqualified shall have any claim of any kind or nature whatsoever against the promoter or against the American Automobile Association or any members of any committee or any official of the contest, because of such disqualification, or the publication thereof, or failure to mention the performance of the disqualified car prior to its disqualification.

FINAL OUTDOOR OPERATIVE TESTS

502—The following tests are imperative at the completion of the contest in grades 1 and 2:

503—Brake Test—The car under test approaches a line across the roadway at its competing speed in the contest, one set of brakes is applied and the distance measured in which the car comes to a stop. The other set of brakes are similarly tested.

A perfect brake stops the car in 50 feet or under; a penalty of one point per foot or fraction thereof is imposed for distances above 50 feet.

504—Clutch Test—The front wheels of the car are rested against a vertical 8-inch curb, the low gear is engaged and the clutch let in. Failure to spin rear wheels, stall the motor or climb curb would be a bad clutch, for which a penalty of 5 points is imposed.

505—Transmission Test—Car must be driven on all different forward speeds and reverse. Failure to drive on any one speed incurs a penalty of 25 points.

506—Motor Tests—A—Gasoline cars, driving with open and closed throttle and advanced and normal spark to test firing. Penalty of 5 points is imposed for each cylinder not firing.

B—Steam Cars—Test to see if motor runs with open and closed throttle; if valve slide action is operative; if running temperature and pressure of steam are possible; if engine simples or compounds; and note if various gauges and controls are operating properly. Penalizations are per penalty schedule.

507—Penalization of Accessories—Speedometers, odometers, lamps, horn, clocks, storm fronts, tops and other accessories shall, at the option of the promoter, be penalized for work done upon them and for breaks and lost parts at final examination, which penalties will not count against the car, but against the accessories carried.

PENALTIES

508—All cars shall start with a clean score.

Any car which for any reason discontinues as a contestant shall be penalized 1,000 points in addition to all previous penalizations.

509—Time—At all controls or checking stations a car is given a 3-minute leeway. If due at a station at 10 o'clock, it has until 10.03 to arrive. The head checker must call aloud, or otherwise announce the time, that waiting contestants can check through during their proper 3-minute leeway.

510—Cars cannot check in ahead of the time marked on the running card, except at the noon and night controls, under penalty of disqualification.

511—After the expiration of the 3-minute leeway, each arrival shall be penalized 1 point for each minute or fraction thereof. See Rule 451.

512—Work—In penalizing for work done on a car, by its driver or passengers, a penalty of one point per man per minute, or fraction thereof, shall be imposed.

513—Penalty for Outside Work—Where work is done on a car by anyone other than the driver or passengers, the penalty will be 2 points per man per minute, or fraction thereof, for each of such outside persons.

514—Work in Running Time—Work must not be done on a car between the time it leaves the official garage and crosses the starting line and between the time it crosses the finishing line and enters the garage at the end of the day's run.

515—Replacement—A—Where a replacement is made by the driver or passengers, the penalization is 2 points per man per minute or fraction thereof.

B—Where a replacement is made by workmen other than the driver or passengers, the penalization is 4 points per man per minute or fraction thereof.

FINAL EXAMINATION PENALTY

516—At the close of the contest, each competing car, after being properly washed, shall be delivered to the technical committee, who shall record all adjustments, replacements or repairs necessary to place in car in a safe and satisfactory condition, and penalties therefor shall be imposed in accordance with the fixed penalty schedule as given in detail in "The Automobile" for March 24, 1910. In this list of penalties, the following heads were used under which the penalties were prescribed for many specific accidents: Lubrication, carburetion, brakes, running gear, cooling, ignition, steering, machinery parts, and steam. These penalties vary from 1 point upward to 500, which is the provision for a broken frame side member, a broken cam, or a broken crankshaft.

Parts of cars not enumerated in the schedule, which are discovered to be faulty, impaired, lost or loose, shall be penalized in due proportion to those therein enumerated.

517—Front and Rear Axles—No penalty shall be imposed when the spread between the two front or two rear wheels, measured at the ground, is ¼ inch or less. When the spread exceeds ¼ inch, the penalty shall be 5 points for each ⅛ inch or fraction thereof.

518—Springs—A sag of 1 inch is permitted without penalty. For each additional ½ inch or fraction thereof, 5 points.

519—Motor Stops—Motors may be stopped at controls and while gasoline is being taken on. Other stoppages of motors between the starting and finishing of each day's run will result in a penalty of 1 point per minute or fraction thereof for time stopped when no work is done on car.

No penalty, however, shall be charged for a motor stop during the time occupied by a replacement or work on a car for which replacement or work a penalty is imposed.

520—The use by a contestant of any part which may be carried by any other car accompanying the tour as a contestant or other-

wise, or which constitutes a part of its make-up or equipment, shall cause the disqualification of the car.

521—In recording time to be penalized, the operator of the car and the observer must mutually agree as to the time when work commences, which shall be immediately recorded on the observer's card, and as to the time when such work ceases, which shall also be likewise immediately recorded.

NON-CONTESTANTS

522—Non-contesting cars must wear a sign or banner, approved by the promoter, bearing the words non-contestant, in letters 4 inches high on the sides and front, and such cars shall be subject to all road rules and regulations of the contest.

523—A car having withdrawn from the contest will be permitted to continue the run, but without the official numbers, and all banners and numbers must be surrendered to the promoter as soon as the car be withdrawn and the words non-contestant displayed as provided in rule 522.

AWARDS

524—At the close of the contest and after receipt of the report from the technical committee of their final examination, the referee shall post on the bulletin board at official headquarters, rule 430, his decisions as to the awards.

528—Summary of Penalties—Time—1 point per minute, or fraction thereof, late in arrival at any control or checking station.

Work—1 point per man per minute, or fraction thereof, for labor by driver or passengers.

2 points per man per minute, or fraction thereof, for labor by workmen other than driver or passengers.

2 points per man per minute, or fraction thereof, for replacement of damaged parts by driver or passengers.

4 points per man per minute, or fraction thereof, for replacement by workmen other than driver or passengers.

3 points per occurrence for replenishing gasoline, oil or water, outside of fuel controls.

Motor Stops—1 point per minute, or fraction thereof, for motor stop when no work is done. No penalty for motor stop during period when work is being done on car, for which work or replacement a penalty is imposed. See rule 519.

POWERS OF BOARD COMMITTEE

1. The committee of the contest board shall manage the tour, with full power to enforce the rules, render decisions and do anything else that would be within the province of the contest board of the American Automobile Association.

2. The committee or its representatives shall have power at all times to make such examinations of the cars and their contents as may be deemed advisable.

3. The committee shall have power to disqualify any car for traveling at any speed which it may consider excessive under the conditions existing at the time, and without reference to these rules.

GENERAL

Entrants, drivers and observers shall consult the bulletin board at headquarters each night for additional information; failure to do so will be at their risk. All points not covered directly with these rules will be subject to the general 1910 contest rules.

HOTEL ACCOMMODATIONS

Hotel arrangements will be under the management of competent hotel men who have had large experiences in rooming guests at conventions and other gatherings. These men will take complete charge of the rooming at each night's stop. The committee particularly requests that no individual hotel reservations be made in advance. No preference will be shown in selection of rooms.

BAGGAGE

Each contestant must take care of and handle such baggage as he and his guests may need.

Columbia Plant Was Merged

(*Continued from page 667*)

The factory is of a peculiar layout, with a large office building, two stories high, and having a large basement, while the main part of the factory proper is three stories high with a high basement making it practically four stories high. This part of the plant has a peculiar shape, consisting of two ells, one of which has the office structure for a top, while the other ell branches out from the side of this, the long part of the latter being by far the longest building of the whole plant, and exceeding 500 feet in length. In addition, an equally long structure of but one-story height, houses part of the immense drop forge shop, the blacksmith shop, the battery rooms, the tin shop, and at the extreme rear, a very large repair shop, where the testers also make their headquarters. All around the rear of the buildings, there is ample space to grow, in unoccupied land the property of the company, while in the front, the power house is located within an angle of the main high buildings. Taken as a whole, the available floor space covers no less than 350,000 square feet, while the land now owned would allow of an addition of an equal amount without crowding or increasing the height of the present buildings.

As to shipping facilities, the factory is served by the railroads through the medium of the company's own siding, well located along the side of the building in which the raw stock is stored as well as that in which the chassis are finished and in which they receive the finishing touches.

In these buildings, not in their present guise however, Columbia cars have been built for the past sixteen years, or since 1895. It is true, that the product did not always have the worth it possesses at present, but viewed from the state of the industry at that time, it doubless was fully as good then as it is considered to be to-day.

Moreover, most of the mechanics who worked on the first Columbia cars of sixteen years ago are still working upon Columbia cars, for the employees of this firm have been well cared for, and have stayed with the firm through many vicissitudes. So, it is not strange in passing through the shop with some officer of the firm to hear that "this man has been with us fifteen years, that man has been here sixteen years, over there is a man who came with us fourteen years ago, etc."

Machine tools are not all new, but those which are too old to lend themselves well to the modern highspeed work are now being removed and replaced by more up-to-date tools, which have been purchased. These additions will bring the plant right up to the minute, and place it in a position to turn out the balance of the projected 800 cars for 1910 in rapid fire order. Following that, the work on 1911 cars will be begun, the present plans including 2,000 of the popular and swift-selling Model 48, and in addition, 1,000 electrics, principally victorias.

Notable among the present tool equipment is the drop forging outfit, which in all fairness is not outranked by any similar outfit in the automobile business to-day. Not alone are there numerous drop forge hammers, but the stock of dies for this work covering many years experience with it, is most full and complete. Camshafts, crankshafts, hubs, all levers, all rod ends, gear blanks, jig and tool blanks, fender irons, body irons, dumb irons for the springs, spring seats, valves, connecting rods, axles; all these and many more are turned out in this most complete shop. In addition to the large number of drop hammers, there are many bulldozers, hand forges, small, and large trip hammers for working over steel required to be of a high quality, while the hardening and tempering outfit is such as to complement the forge equipment. Fully as valuable to the firm as the tools, space they occupy, dies, and small tools to go with them, are the men to operate the machines, the latter all of them old hands. Now-a-days, good hammersmen are very scarce, so much so that men of this calibre are really prizes which far-seeing firms keep close and jealous watch upon. In this respect, the Columbia works is well fixed.

Body building and trimming work for automobiles has become a fine art, and in this, no less than in other departments, the plant at Hartford is fitted out with the best. The body department occupies a full floor of the longest building, where the natty runabouts, stately enclosed bodies, and more usual touring cars are turned out in quantities, but with all the care possible.

At the rear end of the ground floor is located the very large repair shop, from which the testers work also. In this room all repairs are made on old cars brought back for renewal, while the aforementioned testers do their work of taking up bearings and such other little things as the outside test—which is always strenuous—has brought to their notice. In the matter of final testing of the complete chassis the company is peculiarly fortunate in its location, this being on the outskirts of the town, so that the main road alongside of the works may be used without giving trouble. This gives room for a test of many miles of diversified testing, which would not be possible on a limited track.

ACCOUNT OF REPAIR OF AN OLD CAR

(*Continued from page* 661)

The peining process consists of holding the rings on an anvil, or other suitable shape, and with a pein hammer, strike a series of sharp but light taps against the inner surfaces of the rings at equidistant points around the inner periphery, thus gently but persistently forcing the lay of the metal in the rings into the shape which will render it persistent and of the new desired diameter. The rings must be poised on the edge of the anvil in such a way that the metal will tend to flow in the direction which will afford the new and larger diameter, but they will be broken if in the process the novice strikes too hard a blow, landing the face of the pein hammer at too great a distance from the point of support.

An examination of the pistons in the figure will show that they are considerably worn at diametrically opposite surfaces as at P1, and show no wear at all at points 90 degrees around from the worn areas, as at P2. This is evidence of deformation of the pistons, due, no doubt, to an inadequacy of design, and contrary to the usual expectation the surfaces of greatest wear are 90 degrees remote from the surfaces of maximum pressure. This is a point which has never before been brought out, and it would seem that when the pressure comes on the pistons buckle, tending to form an ellipse, which formation is restrained due to contact with the cylinder walls, but the pressure thus exerted over a relatively small area of the total piston surface produces the undue wear as indicated in the illustration.

The connecting rods seem to be of sufficient strength for their intended purpose, but the brasses at the crankpin end show wear in such a way as to indicate that there was a considerable amount of side pressure due, no doubt, to absence of perfect alignment and a lack of proper endshake. Going back to the illustration, it will be observed that the least wear came at B1 and B3 of the brasses, and the greatest wear at B2 and B4. It will also be observed that the liners which separate the large end from the cap were not at all uniform in thickness, and in one of the connecting rods there were no liners at all. This state of affairs seems to indicate either a lack of uniformity in the assembling process, or a considerable amount of wear on a basis which was anything but uniform, as between the respective journals.

TIGHT COMPRESSION NOT READILY REALIZED

The very fact that the pistons show wear over two diametrically opposite zones and no wear on the surfaces, which are 90 degrees remote from the surfaces of greatest depreciation, indicates that the bores of the cylinders are not round, and it is scarcely to be supposed that the packing rings, no matter how well they may be fitted, will serve well their intended purpose under such conditions. If the motor is to deliver even a fair proportion of power, considering its original ability, it will be necessary to rebore the cylinders to make them round, or, what is better yet, they may be ground to a new and true bore.

The blackened zones which show over the piston surfaces, presents evidence of the lack of ability of the rings to maintain tight compression, and, if a proper repair is to be made, it is necessary to not only make the bore of the cylinders round by grinding or otherwise, and then, in view of the now larger diameter, it will be proper to substitute new pistons for the old.

SUMMARY OF REPLACEMENTS INDICATED

In a motor of this size, considering the character of the service it is designed to render, the piston clearance at the top of the stroke should be 0.015 of an inch. This allowance will be sufficient to take care of piston expansion due to heat and assure good lubrication. Were the clearance to be much greater the pistons would slap against the walls of the cylinders and a very annoying noise would result. With the new pistons new packing rings would come as a matter of course, and, for a proper repair, under the circumstances, it looks as if the motor should have been benefited by the substitution of new parts as follows:

(A) New pistons machined to the new diameter to compensate for re-boring of the cylinders to make them round.

(B) New piston rings.

On account of the wear of the cams and the battered condition of the tappets, it is more than likely that it would have been worth while to add:

(C) New camshafts.

(D) New lifts.

(E) New supplementary springs for the lifts.

(F) New brasses for the camshafts.

A close examination of the brasses for the camshafts indicated that the repairman who made the overhauling last year was lacking in skill, and in fitting the camshaft brasses he carelessly filed them down so that they will scarcely serve well for the purpose, although the repair, as it is now completed, is very good indeed; the present work is being done by an expert in this line, and by the proper use of liners, after the brasses were properly shaped up, good alignment was realized, and there is a fair chance that it will remain so for a reasonable length of time.

CRANKSHAFT REQUIRES SOME EXPERT ATTENTION

The condition of the crankpin brasses is a sign of uneven wear of the crankpins, and, if the future performance is to be as good as ever, it is necessary to remove and regrind the crankshaft in order to make the pins round. That they are now elliptical is one of the points that a micrometer will very quickly settle, and that brasses will render good service when they are fitted to elliptical pins is a settled impossibility.

Each effort, when it is directed to the more complete repair of a car, adds responsibility; were the crankshaft reground the diameters of the pins would be reduced, and the brasses might have to be re-babbited. It is possible that 0.010 of an inch off the pins would bring them to round. This reduction would have to be compensated for by reducing the thickness of the liners an equal amount, and since the brasses would have to be re-scraped, they would be reduced in radial thickness at least 0.015 of an inch. This does not sound like a very considerable amount, but it is an important difference, and if it is not to be had nothing remains but to reline the brasses in order to realize it.

There are risks to take in a matter of this sort; if the crankshaft is reground, the strength of the same will be much reduced. Considering the fact that the strength of a crankshaft is proportional to the cube of the diameter, a very slight reduction in diameter has a marked influence on the ultimate strength of the same.

In a new shaft this reduction of diameter is a serious matter, but in an old shaft it amounts to a positive risk, it is well understood that the life of every crankshaft is limited; it depreciates in service; the kinetic ability of the metal reduces as sure as kinetic work is done, and, the older the automobile, that is to say, the greater the length of service rendered, the greater will be the chances of crankshaft failure, after the crankpins are reground to make them round and true.

It might be said, why regrind the pins if the danger is so great? The answer is, why repair the motor if the brasses are likely to melt out when the motor is put back to work. Certainly the chances of bearing trouble will be very great if the brasses are clamped up against elliptic pins.

How can the crankshaft be conserved after it is reduced in strength by the grinding process, which is utilized to bring the pins back to round? Let us examine the law and find out. Secondary moments increase as the square of the velocity. The answer is, reduce the velocity in the ratio, which will limit the extreme fiber strain to a safe point in view of the fact that the extreme fiber strain increases inversely as the cube of the diameter.

Since secondary moments increase as the velocity squared, it follows that any method which will limit the speed of the motor will serve as the remedy. A governor, for illustration, answers every requirement. By adding more teeth to the driving

sprockets, leaving the number of teeth in the driven sprockets as before, the speed of the crankshaft considering the speed of the automobile on the road, will be lowered, and, a governor, if it is so adjusted that the motor will not speed up when the clutch is removed, will afford all the protection that the occasion requires.

In view of what has been said, if the truth is reflected, an unskilled repair man is in a position to play "hob" with an automobile, and the cost of the play falls upon the owner of the car. In a matter of this sort skilled workmen will do as much or more damage than will follow the efforts of unskilled men. Accentuated skill on the part of the artisan is bound to lead to greater activity and the extra effort, if it is in the direction of the reduction in diameter of the crankshaft in the absence of some method of compensation, will serve as the prelude to a broken crankshaft.

SUMMARY OF CONCLUSION FOR THE CASE IN POINT

Considering the automobile, which is taken as the example in this instance, a summary of conclusions are as follows:

(A) The crankshaft should be centered in a grinding machine and all the pins should be ground round and true.

(B) Since the linings of the brasses are worn down, and the shims are in bad shape, to reline the brasses would be proper. The new shims would then be of even thickness, with takeup available for the future, and, after scraping in, the bearings would then be in as good order as when the automobile was new.

(C) This would leave the crankshaft in a precarious state considering a high rotative speed, and in order to correct this evil it would be proper to apply a governor to the carbureter in order to limit the maximum possible speed after declutching.

(D) On account of the unbalanced condition of the clutch (a construction fault which was mentioned), it would be an advantage to add teeth to the driving sprockets in order to limit the speed of the motor when it is running the automobile on a hard level roadbed, and the steadying effect of the extra load thus imposed, while it would tend to load the motor more than before, would be advantageous because it would limit the speed of the same and minimize the kinetic strains.

(E) By setting the governor for a certain safe speed, the motor would be limited in its ability, and the speed of the automobile on a hard level road would then be kept down to a safe point independent of the ability of the motor from the abstract power point of view.

(F) The noted state of the sprocket wheels and chains is such as to call for a new set, and, as before stated, it would be the height of a fallacy to put a new set of chains upon the old sprockets.

(G) In view of the manner in which the side frame was repaired, and the fact that there is no lateral bracing just where the winding effect of the motor is most pronounced, it would be an excellent idea to re-inforce the frame at this point; this is difficult in view of the location, and to accomplish the purpose it would be necessary to apply a curved cross-member, so shaping the same that it would pass under, or over, the flywheel and fasten to the sidebars at a point just back of the rear arms of the motor, in the plane of the flywheel.

(H) Since it is a fair assumption that the parts throughout the whole automobile, one like the crankshaft, effected by speed, the maximum speed of the automobile on the road should be limited to something less than the original speed of the same when it was new. To accomplish this the governor would have to be set accordingly, and, in view of this possibility it would be safe enterprise to use the larger driving sprockets, making them as large as possible, consistent with hill-climbing ability on the high gear.

In the absence of a governor there are other ways of limiting power, hence, speed of the motor. If the best power, considering speed, is due to the use of a magneto (disregarding other points of design for the moment) for ignition purposes, with the same so timed as to deliver an efficient spark at the best possible angle of advance, advantage may be taken of the fact that the angle of advance should be increased with the speed of the motor for the best results. By fixing the spark so that the angle of advance will be insufficient at the higher speeds, the power of the motor will not increase with the speed, in direct proportion to speed, and at the higher speeds, the power will be below the requirement as indicated by the automobile.

In a word, independent of the inherent ability of the motor, the spark may be so set that the speed of the automobile may be limited to, say 40 miles per hour on a hard level road, and this method of treatment will accomplish the desired result, without interfering with the hill-climbing ability of the automobile, because the spark will be sufficiently advanced to do efficient work at the speed of the motor which is likely to obtain in hill-climbing work.

If it is conceded that the original speed of the automobile was 50 miles per hour on a hard level road, then, by limiting the performance to a speed of 40 miles per hour, the strains will be reduced to about 2-3 of what they were originally, and this reduction will obtain throughout the whole automobile, so that safety will be assured, and the repair will be worth while. It is just possible that it is not necessary to make such a large reducton in speed, but this is a matter which cannot be definitely determined, since it depends (a) upon the quality of the material used in the automobile; (b) the time and character of the service rendered by the same, and (c) the character of the repair work done.

This particular automobile was made in 1906; it has done hard and nearly continuous work ever since, and it has not been properly repaired at any time. The body, while it was not positively light, was by no means heavy, and the automobile was speedy; the owner took advantage of this fact as often as possible.

Considering all the attending facts, it is a reasonable assumption that the possible speed, after repair, should be limited sufficiently to reduce the extreme fiber strain in the parts to approximately 2-3 of the original figure, and this will follow in case the speed is limited to 40 instead of 50 miles per hour. In fixing this limit, the gear ratio must be so adjusted that the crankshaft rotation will be reduced in the same ratio, besides taking into account the extent of reduction of the crankpins in case they are centered and ground to make them round.

OTHER PARTS WERE PUT IN GOOD ORDER

The transmission gear, front and rear axles, and other parts of the automobile not previously mentioned, were put in good working order and demountable rims were placed on all four road wheels. A new "dual" ignition system, including a Remy magneto, was installed, so that, on the whole, the cost of doing the work, as here noted down, was not high. This cost includes new ball bearings in the jackshafts, and a considerable amount of labor in divers ways that cannot well be stated.

COST OF ACTUAL WORK DONE

Substituting a Remy magneto and a dual arrangement of the ignition system for the old multicoil and magneto, eliminating the chain drive for the magneto, and other troublesome details	$55.00
Substituting detachable rims for clincher	20.00
New dashboard	15.00
Refinishing the car (paint)	75.00
Bolts, nuts, washers, etc.	5.70
Miscellaneous cash expenditures	45.00
Salaries paid for work done in dissembling the car, repairing the side frame, overhauling the motor, and starting the final assembling process	180.00
Estimated labor costs required to complete the work	60.00
Total cost	$455.70

WITH THE AGENCIES

Eight Hudson runabouts appeared in line in the parade held in Detroit before the start of the Glidden tour last summer. G. W. Dunham, the chief engineer, is in the first car

J. S. Bretz, president of the J. S. Bretz Company, New York

Recent Wisconsin agency appointments are: Cadillac, Park Hotel Garage, E. A. Kemmerer, proprietor, Janesville, Wis.; Kissel, E-M-F, Maxwell, Stoddard-Dayton, Matheson and Flanders, Baack, Reed & Gage Co., 111-113 North Main street, Janesville, Wis.; Overland, Sykes & Davis Garage, formerly Pierson's, 17-19 South Main street, Janesville, Wis.; Ford, Blodgett & Holmes, Riverside Garage, Janesville, Wis.; Overland, Merrill Iron Works, Merrill, Wis.; Overland, Calumet Auto Co., Brillion, Wis.; E-M-F, Flanders, Collmar's Garage, Baraboo, Wis.; Overland, L. P. Helm, Baraboo, Wis.; Reo, Wilke Garage, Sheboygan, Wis.; Overland, T. H. Jacobs, Wausau, Wis.; Badger, W. T. Schwantz, Lowell, Wis.; Jackson, Fuller, Cochrane & Son, Fox Lake, Wis.; Ford, Mayville Auto Co., Mayville, Wis.

A Baltimore branch for the Washington car has been established at North avenue and Oak street. The Auto Trading and Garage Company has been organized for handling this car here. The officers of the new company are Philip Wenchel, president; Jacob Baumann, vice-president; F. W. Lilly, treasurer, and W. Howard Schweizer, general manager. Messrs. Baumann and Lilly have the State agency for the car, with headquarters at Catonsville, Md.

The recently organized U. S. Auto Company, of Cleveland, has leased a large garage on Euclid avenue for five years and has received demonstrators of the Paterson "Thirty" and the Whiting lines, for which cars the company will act as agents. E. E. Robbins is president of the company, and A. A. Grimes, recently Jones speedometer salesman, will have charge of the sales.

The John Deere Plow Company, of St. Louis, Mo., Southwestern distributor for the Jackson Automobile Company, of Jackson, Mich., has appointed the following Jackson agents in Texas: Eikel Automobile Company, San Antonio, Tex.; Wortham-Shotts Company, Fort Worth, Tex.; Lee, McKallif & Abbey, Houston, Tex.

The Korach-Kraus Motor Sales Company has been organized at Cleveland by E. J. Korach and E. F. Kraus for the purpose of distributing the De Tamble models in Ohio. The company has acquired large salesrooms on Euclid avenue.

A new home for the Pierce-Arrow car is in the course of construction at 812 North Charles street, Baltimore. This store will be occupied after May 1 by the Foss-Hughes Motor Car Company, H. J. Sturdevant, manager.

The Standard Motor Car Company has added to its agency in Nashville the Empire 20 and the demonstrating car is expected to arrive within the next few days.

The East St. Louis Automobile Company, of East St. Louis, Ill., has taken the agency for the Jackson.

The Olds Motor Works' Louisville branch has made arrangements whereby Hamilton & Dodge, of the Phœnix Motor Car Company, of Lexington, become a branch of the Olds Motor Works.

Charles E. Miller recently announced the opening of another branch at 601-603 Baronne Street, New Orleans, La., for April 1. This makes eleven stores that Mr. Miller is operating.

H. A. Reifenberg, formerly of the Detroit branch of the Warner Instrument Company, has been given charge of the new office of that company at Kansas City.

The Toledo agency for the Paterson "30" has been landed by E. F. Lienhard, one of the most enterprising dealers on the banks of the Maumee.

The Davis-Bell Hardware Company of Itta Bena, Miss., has secured the agency in that section for the Maxwell cars.

The Presto-Lite Company has established a branch in Cleveland and a recharging plant. S. M. Paxton is manager.

The Jackson will be represented in Florida this year by C. F. Irsch, at Tampa, and McIver & McKay, at Ocala.

The Deere Implement & Vehicle Company, of Montgomery, Ala., will handle the Jackson this year.

Tuschen Brothers, of Watertown, Wis., have added the White, Waverley electric and Halladay cars.

Bretz Says Torpedo is Passing

J. S. Bretz, head of the J. S. Bretz Company, returned Monday from a flying business trip to Europe. He left New York on March 9. The chief part of his time abroad was spent at Schweinfurt-on-Main, where the F. & S. steel ball factory he represents, is located; at Liège, Belgium, and in London. While in Germany he had an opportunity to see the new types of German cars.

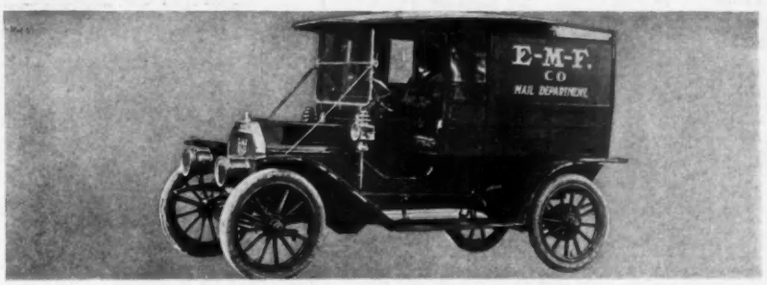
"At the Opel factory they are getting away from the torpedo shape," said Mr. Bretz. "The newest style of body slopes slightly inward at the back, and the radiator comes almost to a point, in an effort to decrease atmospheric pressure.

"I visited Henri Peiper, of the Société Internationale de l'Electricité, at Liège, Belgium, and then returned to London. One of the most interesting things I noticed about British motoring was the almost universal use that is being made of the Rudge-Whitworth detachable wire wheels."

While in Germany, Mr. Bretz witnessed the making of some steel ball bearings, nine inches in diameter, such as are used in the heaviest types of battleships to revolve the turrets.

Owing to the peculiar bungling of a cablegram by a London hotel, Mrs. Bretz failed to meet her husband as planned, and they passed one another on the high seas.

AMONG THE GARAGES



This E-M-F car takes care of the mail service of the Detroit factory of the Everitt-Metzger-Flanders Company. During February it delivered 143,000 pieces of mail satisfactorily

Horace De Lisser, vice-president of the U. S. Motor Company

B. M. Shea, manager of the George C. John Motor Company, New York, says that each year finds a larger volume of all-the-year-around business at the garage of the company. He says that the general use of the automobile has resulted in holding hundreds of business men in New York in Summer, who formerly visited distant summer resorts. The use of the car in their cases, takes the place of tiresome and expensive Summer trips.

The garage of the Warner Motor Company, at 1204 New Hampshire avenue, Washington, D. C., is reported to have been purchased by W. H Wyman. The garage is two stories in height, with a frontage of 70 feet on New Hampshire avenue, and has about 3,000 square feet of floor space. Mr. Wyman will do a general repair and garage business, and also wishes to embark in the manufacture of machines of his own design.

The store-room and garage of the De Dion-Bouton Company at Fifty-first and Broadway, New York, is in course of reconstruction. The partitions that formly cut up the interior of the garage have been torn out and the whole space will be utilized in the near future. The shops and boiler room have been removed to a small building adjoining the garage in the rear, thus affording considerable additional room.

At Marietta, O., Hinds & Bailey will make extensive improvements to their garage and sales agency on Putnam street. An addition will be erected in the rear of the lot, giving almost double space. A new arch entrance will be made on Putnam street and a second entrance will be made on Second street.

Automobile owners in Minneapolis now have all-night service as far as regards the repairing of their automobiles. The Parger garage has started keeping open house 24 hours a day in its repair department, and this innovation permits owners to have their cars washed or repaired at all times.

The Carl H. Page Company, 1627 Broadway, which handles the Chalmers cars, is seeking more room for its garage. Garage Manager James Bell says he sent out 116 new cars during March, but was seriously handicapped by lack of space. No new location for the garage has been selected.

At New Philadelphia, O., Edward Goodwin is remodeling the skating rink into a modern garage, which will be opened at once. The main portion of the building will be used for storage purposes and the rear is fitted as a repair shop.

Eastern Texas will have its first garage when the East Texas Automobile Company opens its quarters in Palestine, Tex. It will be located in the Wainwright Building, on Avenue A, and will be managed by W. H. Brooks.

Work has been begun on the new Packard garage in Portland, Ore. The building, which is located at Twenty-third street and Cornell road, will cost $30,000.

The Woodville Garage Company, of Woodville, Sandusky County, O., was incorporated with a capital of $10,000 by Fred H. Hartman, W. H. Price, Charles A. Kuhlman, William Uschel and J. T. Smith.

A. J. Schnell, the Scranton, Pa., agent for the Pullman, will erect a one-story brick garage, 40 by 74 1-2 feet, at 119 Jefferson avenue. It is expected that it will be ready for occupancy some time next month.

Work on the new Stevens garage to be installed in the Mosgrove block, Urbana, O., is progressing rapidly and will be ready for occupancy May 1.

Brief Personal Trade Mention

Irving H. Manning, recently with the American Locomotive Company, has joined the selling force of the Warner Instrument Company, as special representative. Mr. Manning has been selling cars for twelve years or more. For five years past his headquarters have been New York City.

Walter Schmunk, formerly of Cleveland and for several years identified with the automobile industry, has left the Boston branch of the White Company to return to Cleveland where he will be connected with the sales department of the Peerless Motor Car Company.

Julian G. Kursten, paying teller of the Union Trust Company of Detroit, and assistant manager of the Clearing-house Association, has resigned to accept a position with the selling force of the Anderson Carriage Company, making the Detroit Electric.

John W. Bate, designer of the Mitchell car and superintendent of the works of the Mitchell-Lewis company, of Racine, is enjoying his first extensive vacation trip. Mr. Bate will visit various countries in Europe, especially Italy.

E. J. Bohannon, assistant secretary of the Louisville Automobile Club, has resigned to become identified with a business house. The resignation will become effective May 1. His successor has not yet been appointed.

A. B. Barkman, for over four years connected with the Maxwell-Briscoe interests, and who has been one of the district managers of the company, has been appointed sales manager of the Maxwell organization.

George H. Votteler, for many years prominent in Cleveland business circles has entered the automobile field and accepted an offer from the Sterling Motor Sales Company, Ohio agents for the Sterling.

F. A. Bowers, for the past 10 years master mechanic and designer of pressed-steel stamping tools for the O. A. Smith Company, has resigned. His plans for the future are indefinite.

Office building recently added to the Maxwell-Briscoe Motor Company's plant at Tarrytown, N. Y. The architecture is in keeping with the suburban landscape

Merle L. Downs, secretary of the A. L. A. M. Show Committee

The Continental Motor Manufacturing Company, of Muskegon, Mich., manufacturer of automobile and marine motors, is constructing an addition to its machine shop, 132 feet by 160 feet, and adding two additional floors to its stock warehouse, which will give additional floor space of about 12,000 square feet. An extension, 40 feet by 150 feet, is also being made to the motor-testing building. The additions will give an additional floor space of approximately 40,000 square feet. The construction work is being pushed and it is expected will be ready for occupancy about May 1.

The Mitchell-Lewis Motor Company, of Racine, Wis., manufacturer of the Mitchell, is completing its new testing track, which is one-half mile long and wide enough for two or three machines abreast. A track was built last year, but did not prove adequate because it was built hurriedly. The new track is built to be permanent. The completion of this track obviates the necessity for using any public highways for testing purposes.

The West Milwaukee shops of the Chicago, Milwaukee & St. Paul Railway are turning out from three to five "automobile" freight cars daily, the demand having grown enormously. Manufacturers whose plants are situated along the Milwaukee road lines are not satisfied with the old-fashioned freight car. The new cars are of 60,000 pounds capacity and are marked "Automobile" on either side.

The Kelly-Toledo Tire & Rubber Company has been organized at Toledo with a capitalization of $375,000. Charles F. U. Kelly, for many years identified with the Akron industry as sales manager, will be general manager. The new company will erect a large factory in Toledo, employing 500 men, and will devote most of its time to the manufacture of automobile tires.

Papers have been filed with Secretary of State Thompson of Ohio increasing the capital stock of the Firestone Tire & Rubber Company from $5,000 to $4,000,000. The company, which was formerly a West Virginia corporation, was recently chartered with the small capital to permit of its organization before the capital was increased to the amount desired.

N. Lazarnick, photographer, with headquarters in New York and a branch office at 870 Woodward avenue, Detroit, is making a tour of the principal automobile manufacturing centers with a view to opening branch establishments at Cleveland, Indianapolis, and such other points as would seem to be of sufficient promise to make it worth while.

The National Rubber Tire Manufacturing Company has been organized and incorporated to manufacture automobile tires, non-skid treads, and inner tubes. The company expects to complete arrangements for manufacturing within the next thirty days. The present headquarters is Bullitt Building, Philadelphia, with Clifford R. Skinner in charge.

The Cass Motor Truck Company, capitalized at $300,000, has been organized at Detroit, for the purpose of building commercial vehicles. The incorporators are: John I. Turnbull, George G. Epstean, Alex M. Spater and F. W. Ferguson. The company is negotiating for a site upon which an extensive fireproof factory will be erected.

The Packers' Motor Truck Company has been organized in Pittsburg with a capital of $100,000 by W. M. Zoller and E. K. Callahan, of this city; James F. McGarry, of East Liverpool, Ohio; Geo. P. Pratt, of Buffalo, N. Y., and Albert M. Schenk, of Wheeling, W. Va. The company will manufacture two and three-ton trucks.

At a meeting of the stockholders of the Findlay Carriage Company, of Findlay, O., it was decided to increase the capital stock from $50,000 to $150,000 for the purpose of opening a department for the manufacture of automobiles. The first car, a gasoline runabout, has been finished and tested.

C. West & Company, carriage builders, who have been located in Duquesne Way, Pittsburg, since 1847, are opening an automobile department, which will be under the management of W. F. Melhuish, Jr. They will handle the Simplex car, and will also build bodies for the Buffalo truck chassis.

The Lozier Motor Company has purchased 65 acres of land in the east end of Detroit, at an approximate cost of $2,000 an acre, as the site for an immense plant. It is announced that construction work will begin early in April. The location has both railroad and street car facilities.

At the annual meeting of the board of directors of the Keller Manufacturing Company, Philadelphia, the following officers were elected: Julius Keller, president; W. P. Pressinger, Wm. H. Keller, S. W. Prince, vice-presidents; Francis J. Rue, treasurer; C. S. Bell, secretary.

It was rumored last week that the price of the Hupmobile, as made by the Hupp Motor Car Company, Detroit, would be advanced in price to $800 from $750. Later advices direct from the company are to the effect that the price will not be advanced.

The Pierce Motor Company, of Racine, Wis., has already started its engineers and draftsmen on 1911 models. The torpedo style, which is being produced in limited quantities, will be incorporated in the regular 1911 line.

The Franklin Commercial Truck Company has been formed at Franklin, Pa., by Charles H. Sheanley, Charles E. Trace and Harry A. Myers, and will manufacture an automobile truck.

The Consumers Rubber Company, of Cleveland, has taken the agency for Star tires. The Star Rubber Company, Akron, began to make automobile tires a few months ago.

The Hercules Specialty Company, of Grove City, Pa., has secured James McIntosh as superintendent, and will begin the manufacture of motor trucks at once.

The third semi-annual dividend of 3 1-2 per cent. was paid April 1 on the preferred shares of the General Motors Company.

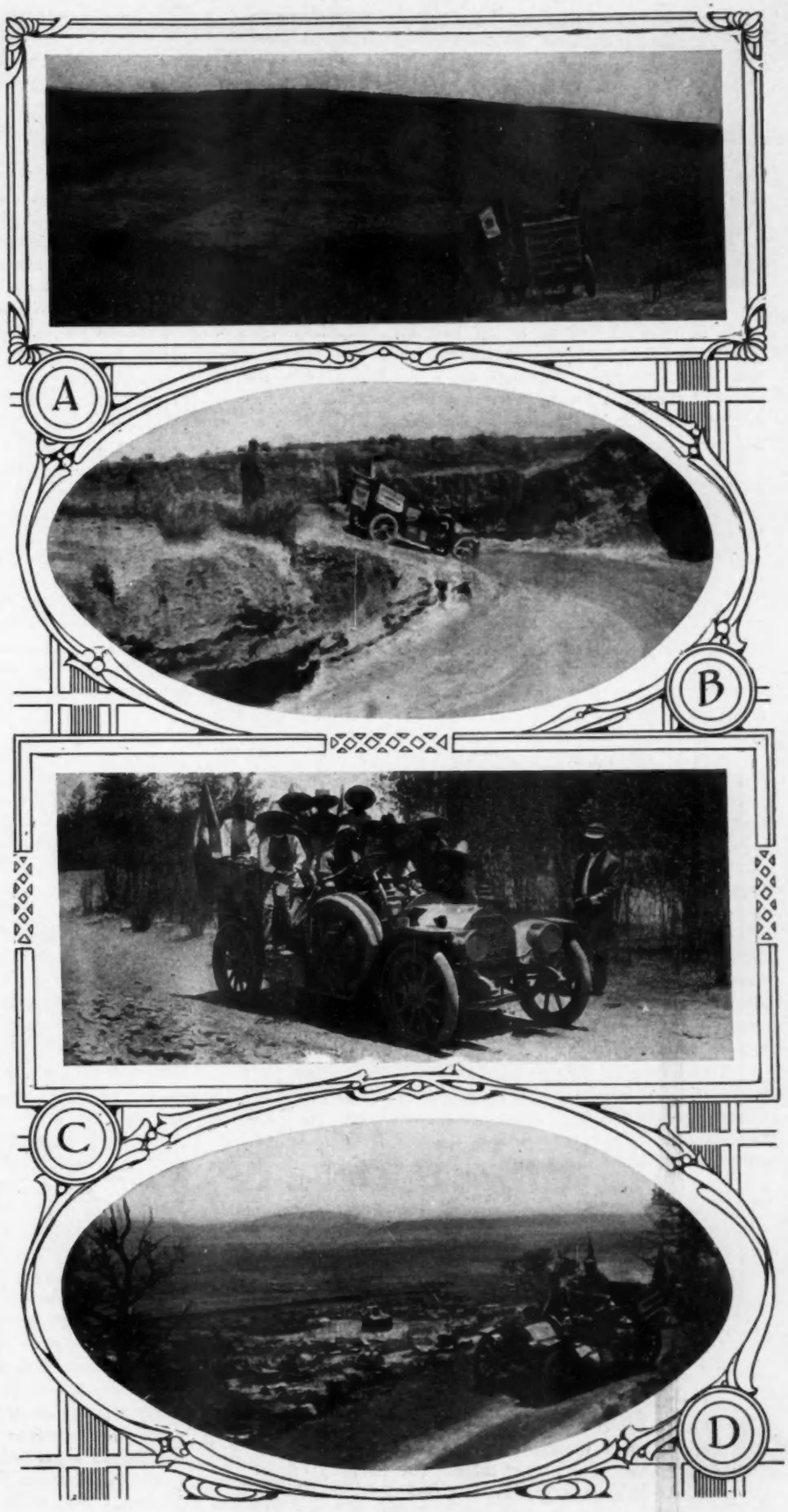
FLAG TO FLAG

With a score or more cars assured of entry in the Flag to Flag Contest for the Wahlgreen trophy, which starts at Denver City May 2 and finishes at Mexico City, the event promises an interesting and valuable trip. The course, as laid out, is about 2,500 miles long and is largely planned through country that is new to the automobile.

The course will be south from Denver, through Colorado Springs, Pueblo and Trinidad to the southern boundary of Colorado. This country is a desert during the greater part of each year, save for the spots where irrigation has served to make it a luxuriant garden. In sight of the route, to the westward, the snowy caps of the Sierra Blancas tower into the Italian blue of the unclouded sky, while the exhilarating air and good roads lend themselves to the enjoyment of the tourist. Crossing the New Mexican boundary, the course leads on through the Raton foot hills and stretching southwestward enters Texas in the rolling Panhandle country. The route touches Amarillo, San Angelo, Kerville, near the center of the State, and then, swinging back, circles through San Antonio. From thence the course is straight to the Rio Grande, crossing at Eagle Pass in our romantic sister republic. The route from the border traverses the State of Coahuila to Torreon, thence south to Zacatecas and Aguas Calientes. From this point, rich in interest for Americans, the route swings easterly through Celaya, San Juan del Rio and Tula to the capital.

It has been estimated that the trip should cost about $5 a day for each man and an allowance of $5 a day for each car should also be made. Gasoline and oil will be furnished free to entrants by the Waters-Pierce Oil Company at numerous supply stations all the way from Denver to Mexico.

The tour is under the management of G. A. Wahlgreen, donor of the trophy, who is assisted by G. A. Blanchard, assistant manager. The aim of the project is largely educational, as the country traversed en route is rich and able to buy large numbers of cars.



A—Road Leading Down Into Raton Valley, a 3,000-Foot Drop
B—Chalmers Pathfinder in an Arroyo, 35 Miles from Trinidad
C—Knipper Giving a Crowd of Mexicans Their First Auto Ride
D—Descending Raton Mountain, with the Town of Raton Below

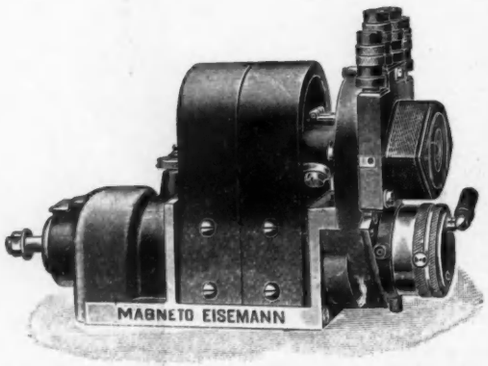
PROMINENT ACCESSORIES

AUTOMATIC ignition timing has frequently been tried on automobile engines, but hitherto has met but a slight measure of success. Although on a number of cars the absence of the usual timing lever may be remarked, the majority of these avoid it by the use of fixed timing. However, no one has ever attempted to dispute the desirability of an automatically timed ignition, if its apparently inherent disadvantages could be done away with; and the announcement of the makers of the Eisemann magneto that they have perfected such a device will be received with the greatest interest by all automobilists.

The device in question is simply a fly-ball governor arranged on the magneto shaft, and built in with the magneto as a unit. The governor balls act through bell cranks to shift a sleeve on an extension of the armature spindle. This sleeve is provided with internal threads of a square section which engage with corresponding external threads on the armature spindle. These threads are of a steep pitch, and as the governor acts they serve to rotate the armature shaft relatively to the governor shaft, through which the driving power is transmitted.

It will be noted that in this system the armature as a whole is rotated, thereby causing the break at the time of the maximum strength of current regardless of the amount of advance. Such a system, of course, gives a spark of equal intensity at a given speed of the magneto, and permits of utilizing the hottest sparks of which the magneto is capable. It is stated that because of this a quarter turn of the crank suffices to start the motor.

Another ingenious feature has been incorporated in this magneto, namely, a device for facilitating setting the armature with respect to the crankshaft. In the rear portion of the regulator housing is a slot into which may be inserted a correspondingly shaped key. The sleeve, which is rigidly connected to the armature shaft, is square and the key will fit into either of two sides of the square. When the key is inserted, the armature is held stationary in the position in which the platinum points of the circuit breaker begin to move away from each other. With this device it is no longer necessary to look at the make-and-break mechanism to determine the moment at which the points are separated. The Eisemann magneto is now handled in this country by the Eisemann Magneto Company, 225 West Fifty-seventh street, New York City. The magneto itself, of French manufacture, is favorably known and is used as standard on a number of high-grade cars. The company is also prepared to meet the requirements of the aeroplane industry, having brought out a lightweight magneto specially designed for use on aeronautic motors, in which aluminum has been freely used.



Eisemann Magneto with Automatic Timing

The Safety Tire Gauge Company, 315 Dearborn street, Chicago, is offering to automobilists the type of tire gauge illustrated herewith. It is a combined pump connection and pressure gauge. It makes a very convenient pump connection, and by means of the protruding rod, which is forced out by the air pressure within the body of the device, the pressure is always indicated. The gauge is stoutly constructed, and will stand hard knocks in the tool box without injury.

"Safety" Tire Pressure Gauge

If automobile engines ran at a constant speed, the problem of electric lighting and storage would be simple, but as the engine speed varies from zero to 1,500 revolutions a minute, some method of governing the output of the generator is necessary. The latest method of accomplishing this end is by the Ward Leonard system of electric lighting, which has been brought out by the Ward Leonard Electric Company, Bronxville, N. Y., and was specially designed for automobile service.

In this system the generator is a small dynamo mounted on the engine, by which it is driven through a magnetic clutch. When the dynamo speed is such that the dynamo voltage is equal to or slightly greater than the battery voltage, the circuit is established automatically, and the output of the dynamo charges the batteries. When the dynamo slows down, the circuit is automatically broken. The automatic switch also breaks the circuit to the magnetic clutch when the charging amperage exceeds the proper amount. Two storage batteries are provided, one of which is used for lighting, while the other is used for ignition. Besides the usual lamp equipment, the electric system will also provide current for a horn, a reading light, a speedometer light, a cigar lighter and a trouble light.

The Mechanical Instrument Company, 120 Liberty street, New York City, has brought out an instrument under the name of the "Mico reciprocating meter" for registering accurately the total feet of travel of all reciprocating motions. The instrument resembles a large speedometer in appearance, having a circular dial face reading up to 10 feet, on which a hand travels clockwise, and a counter reading up to 100,000,000 feet. It is connected with a crosshead or other reciprocating part by a flexible bronze cable which winds around a drum on the rear of the instrument. This handy little meter will be of the greatest possible value to factory engineers and superintendents, in that it will enable them to check up the operation of steam pumps, and other similar machines with accuracy, while its simplicity makes it easy operable by any employee.

Limousine owners will doubtless fancy the toilet rack watch which screws into the toilet rack or vanity box usually included in the equipment of closed cars. The watch is in three parts, two of which screw together, clamping between them the leather of the case. The back snaps on, making the mechanism dust and damp-proof. The watch may be wound and set without removing from the rack. The watch regularly furnished has seven jewels, Breguet hairspring, cut expansion balance and other standard features. It is made by the New England Watch Company, Waterbury, Conn., and should be warmly greeted by the trade.

"Limousine" Watch for Closed Cars